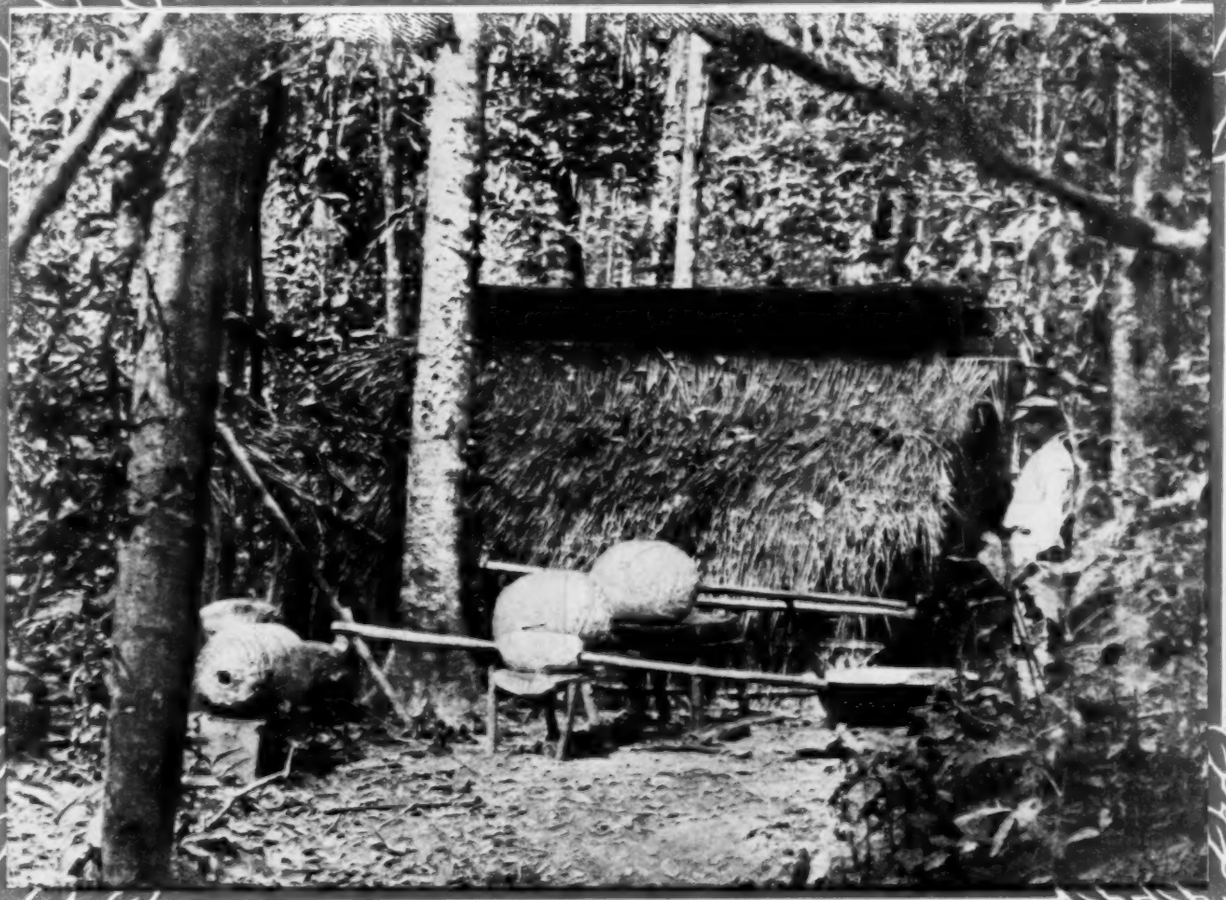
THE RUBBER AGE AND TIRE NEWS



Preparation of Hard Para Rubber in the Amazon Country

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THE RUBBER AGE AND TIRE NEWS

DECEMBER 25, 1917 VOL. II. NO. 7

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INDEX TO CONTENTS

	PAGE
The Manufacture of Rubber Soles and Heels.	247
The Depolymerization and Oxidation of Raw Rubber	250
Information Exchange	252
Chemical and Physical Testing of Crude Rubber	253
Editorials	257
Rules and Regulations Covering Rubber Importations	258
News of Interest to the Rubber Industry	261
Notes from the Rubber Metropolis	262
Activities of the Rubber Association	263
With Men in the Trade	263
American Rubber Patents	264
Market for Manufactured Rubber Goods	265
The Fabric Market	265
Chemicals and Compounding Materials	266
The Crude Rubber Market	267
Scrap Rubber	267
TIRE NEWS:	
Tire Adjustments	269
Demand for Factory Brand Bicycle Tires	269
Ramifications of the Automobile Industry	270
Items of Interest to the Tire Trade	271

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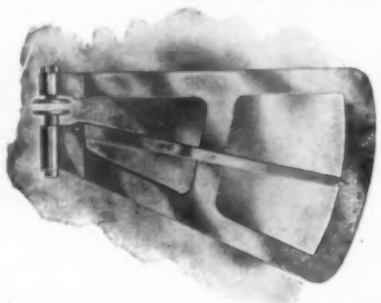

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THE
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The Manufacture of Rubber Soles and Heels

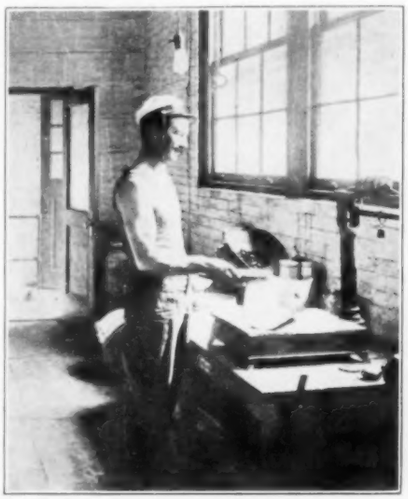
By C. S. Redfield

Several years ago the demand for rubber soles was quite considerable, and several rubber manufacturers began manufacturing them. The proposition of competition then entered and down went prices and quality, until finally soles which were absolutely worthless were made. Shoe manufacturers, considering price only, made thousands of pairs of shoes with these cheap soles. The goods went on the market and invariably, after the shoes were worn once or twice the soles cracked across and consequently the public became disgusted with rubber soles. The shoe manufacturer dropped rubber soles at once.

About 1912, the rubber sole fad started again and the rubber sole manufacturer, remembering his past experience, did not try to make soles for price only. They did not try to make soles from compounds costing six to eight cents per lb. For cheap shoes there were made, however, soles the compound of which cost around ten cents per lb. This figure seemed to be the lowest limit for producing a sole which would not crack and which would give a few weeks' wear. Such soles would usually outwear the uppers of the shoes for which they were made, especially if the wearer encountered a little rainy weather.

The last development is the fiber sole. The same compound with a little fiber added will give more than double the wear of the original rubber compound. The fiber sole gives exceptional wearing qualities, is lighter than the rubber sole and is impervious to moisture.

The great objection to rubber soles is their weight. They make a pair of shoes very heavy. This has, in a great measure, been overcome by the fiber sole. The great majority of rubber soles have a specific gravity of 1.60, with the advent of the fiber sole this was reduced to the vicinity of 1.30. So that the fiber sole is a competitor of leather soles, especially in view of



Weighing Ingredients in Compound Room

the high price of the latter, and in view of the fact that the fiber sole has many other advantages, including greater wearing qualities and being moisture proof.

The phenomenal rise in the price of sole leather has had a stimulating effect on the fiber sole and they are being manufactured in enormous quantities for use on new shoes in place of sole leather. Some idea of the proportions this business has attained can be obtained from the announcements of two of the large rubber companies, one that their output for 1917 will be 25,000,000 pairs of soles, and the other that if all of their fifty-seven buildings could be devoted exclusively to the manufacture of their rubber soles, they would still be unable to supply the demand.

All rubber soles and heels can be divided into two classes: first, those which are advertised and bear a trade mark, and whose quality is maintained with some degree of uniformity and the price on which is fairly constant, and second, those soles and heels made for the shoe manufacturer who places them on new shoes. Here the quality is very varying and depends upon the kind and quality of shoe.

Examples of soles of the first class are Durflex, Neolin, Textan, Rinex and Nusolin.

Examples of heels of the first class are O'Sullivan, Cat's Paw, Wingfoot, Essex and Panther.

Most manufacturers of soles and heels make goods of the second class.

The manufacture of soles and heels consists of nine distinct operations, viz.: Compounding, mixing, sheeting, cutting, curing or vulcanizing, trimming, inspecting, packing and shipping.

I will take up these items separately and endeavor to show how they are generally carried out.

Compounds and Compounding

Soles and heels are made in black, gray, red, white and leather color. They are also made in several other colors, such as green, but the above are recognized as standard. The black is made with lampblack and M. R. X. The gray is obtained usually by means of "sulfuring."

The red is obtained with red oxide of iron, except a very few high quality soles, which are colored with sulphurette of antimony.

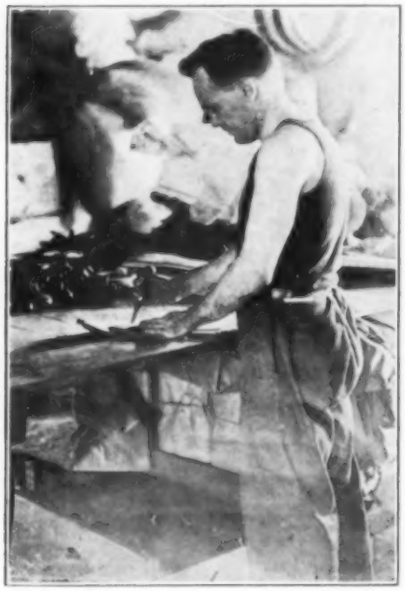
The white is best obtained with lithophone, which is better than zinc oxide for strictly white goods; since zinc sulfide, of which lithopone contains 28-30 per cent, has much more covering power than zinc oxide, and furthermore, lithopone has a much

less specific gravity, although zinc oxide has more of a toughening effect.

The leather color is obtained with lead chromate and red oxide in the proportions of ten to one.

Fibers

As fibrous fillers for rubber soles there are in use today several materials. Among them might be mentioned ground cotton wrappers, carpet wool scrap, ramie or china grass, and ground scrap leather. These



CUTTING SOLE BLANKS

fibrous materials are finely ground, then put through a sifter to insure their being uniform.

In regard to the use of leather, most kinds are burned when subjected to the vulcanizing temperature, especially in press work. There are several methods of avoiding them, viz., treating the ground leather with a solvent for the removal of the constituents which cause burning, or heating it for a considerable period of time. This volatilizes or polymerizes the fats and then it will not burn. There are some kinds of leather which seem to withstand the vulcanizing temperature without treatment in any way, among them being glove leather. The use of leather as a fibrous material in fiber soles has not attained very large proportions, although one concern, which has used a considerable proportion of ground leather in its soles for some time is putting out a sole with exceptional wearing qualities.

The compound for rubber soles is largely composed of shoddy. For high grade, red, black and gray soles the compound should not cost over $18 per cu. ft., and the specific gravity should run between 1.45-1.55. For high grade white the cost per cubic foot should not exceed $23—and the specific gravity will run between 1.85-1.95. For cheap goods of red, black and gray soles the compound may run as low as $11 per cu. ft., and for white $15 per cu. ft. It is not advisable to go much lower than this, and even with a compound of this quality it must be left well undercured to prevent its cracking across on aging. The specific gravity of this class of goods will run between 1.60-1.70 for red, black and gray, and for white between 1.90-2.00.

The high quality rubber sole made of rubber, shoddy and compounding materials is disappearing from the market, and in its place we have the fiber sole, which is composed of some rubber, shoddy, little compounding material, treated glue and ground fibrous material. The use of organic accelerators in such compounds is practical only when the rubber used contains some organic filler.

The cost on red, black and gray fiber sole stocks should not exceed $15 per cu. ft., and for white $20.50 per cu. ft.

A few compounds here will give a basis for working up sole and heel stocks:

HIGH GRADE FIBER SOLES

Red.		White.	
10	Rubber.	15	Treated Rubber.
75	Reclaimed Tires.	5	White Vacite.
5	Pontianac.	3	Pontianac.
2	Calcined Magnesia.	12	Cotton Fiber.
4	Sulfur.	15	Lithopone.
10	Red Oxide.	1¼	Sulfur.
35	Ground Cotton Fiber.	2	Magnesia Oxide.

CHEAP SOLES

Red.		Black.		White.	
3	Rubber.	5	Rubber.	15	Rubber.
7	Pontianac.	4	Pontianac.	12	White Substitute.
25	Reclaimed Tires.	25	Reclaimed Tires.	22	Lithopone.
10	Ground Red Packing.	1	Sulfur.	20	Whiting.
6	Corn Oil.	4	Lampblack.	5	Zinc.
10	Red Oxide.	3	Zinc Oxide.	10	Carb. Magnesia.
18	Whiting.	2	Lime.	2	Lime.
4	Zinc Oxide.	2	Tar.	2	Sulfur.
2	Lime.	25	Whiting.	10	Corn Starch.
1	Litharge.	5	M. R. X.		
2	Sulfur.				

MEDIUM GRADE FIBER SOLES.

Black.		White.	
5	Rubber.	10	Rubber.
25	Reclaimed Tires.	3	Pontianac.
7	Cheap Recld. Hose.	35	Good White Recld.
15	Ground Cotton Fiber.	5	White Substitute.
1½	Sulfur.	2	White Vaseline.
3	M. R. X.	20	Lithopone.
½	Lime.	7	Whiting.
		2	Lime.
		3	Magnesia Oxide.
		5	Sulfur.
		10	Ground Cotton Fiber.

First-Class Heel.		Cheap Heel.	
7	Rubber.	1	Rubber.
5	Pontianac.	20	Reclaimed.
40	Reclaimed Tires.	3	Corn Oil.
1¾	Sulfur.	24	Whiting.
5	Red Oxide.	5	Red Oxide.
1	Litharge.	2	Vaseline.
12	Zinc Oxide.	½	Lime.
15	Whiting.	1	Sulfur.
25	Ground Red Sheet.		

Mixing

The mixing is done on ordinary rubber mills and batches should weight from 90-100 lb., depending on the size of the mill and gravity of the stock. The above figures are for medium sized mills. The rolls should make from 16-22 turns per min. and the stock can be mixed on very hot rolls, because of the large amount of shoddy and substitute and small amount of rubber in the batches. Care should be taken, however, not to "scorch" the stock as such stock will show bad aging qualities. Carrying a good heat on the rolls makes the stock mix more readily and gives a large production from each mill. The rubber and shoddy with pontianac are usually worked up together until a plastic mass is obtained, after which the compounding materials are put in. The mixing of these stocks is not very difficult and does not require a millman with much experience.

Sheeting

Before the mixed stock can be cut into shapes suitable for molding it must be sheeted. For heels the stock is sheeted on the mill. The stock is cut from the mill and trimmed into sheets about 3 x 2 ft. The thickness of the stock, as cut from the mill,

should be from 1-16-⅛ in. thicker than the finished heel, depending on whether a whole, half or French heel is to be made.

The sheeting for sole blanks is usually done on the calender. The stock is run between cloth sheeting liners, nearly the full width of the calender rolls and made up into large rolls of about 1,000 lb. each. These rolls are handled by means of trucks and chain falls. The thickness of the stock should be such that it can be "plied up" so as to give the proper thickness of the sole plus the overflow. The stock for soles can be taken from mills, but it is much cheaper to handle it on the calender and in large rolls as described above.

Cutting

The cutting of sole and heel blanks is usually done with a die and beam dinker. There are several other methods, but this is general practice.

The dies should be made as safe as possible for the workmen. The great tendency is to get the fingers mixed up with the die. Several methods of avoiding them have been tried. A shallow die has been made and a handle attached to this. This method works out fairly well, but there is a tendency for the die to strike the stock on an angle and when it hits the cutting block, being on an angle, it chips the cutting block badly, since the block is built up of pieces grain up. This is especially true of heel dies.

The best method of overcoming the danger of the loss of fingers in the cutting operation seems to be to make the cutting die of a height greater than the width of the hand and furthermore, to groove the sides of the die. The operator must then grasp the die in the grooves which keeps his hand away from the top of the die. With a die of this nature a man can cut much more rapidly since he has only to watch the stock while with the old style he must also watch his hands.

Cutting of Heel Blanks

A pair of finished heels of each size and style should be cured without washers. It should be done for each stock. This gives the weight of stock in a finished heel, i. e., the weight of stock the mold is going to hold.

The sheets of stock 2 x 3 ft. coming from the mill room are placed on the cutting block of the beam dinker. The cutting block is then adjusted so that the die will cut through the stock to the block. It should not, however, cut into the block for any considerable depth, as this not only causes a considerable wastage of cutting blocks, but, also slows down the cutting operation. The beam dinker is started and the die is run across the sheet of stock by hand, care being taken that the die does not strike the stock on an angle. After a few blanks have been cut they should be placed, singly, on a balanced scale (as Howard Trip balance No. 21,512, A. H. Thomas Co., Philadelphia) and balanced against the same size, style and stock of heel already cured without washers, mentioned above. The blank should be slightly heavier than the finished heel. If, however, the blank is found to be lighter than, or considerably heavier than, the heel of same size and style cured without washers, the blanks and sheet of stock should be rejected and returned to the mill room for resheeting. The light blank would not fill the mold properly and the heavy ones would cause excessive overflow.

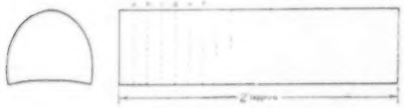
The weighing of blanks in this manner causes considerable saving of time, material and labor, since no blanks are sent to the pressroom which are not suitable for molding purposes. Those which did not cut through the sheet are usually pulled out by hand by boys and these blanks together with those already cut through are placed in boxes, a tag showing stock, size and style being placed on the box. They are then taken to the pressroom for molding. Boxes, metal or metal lined, should be placed behind the beam dinkers. These boxes should be marked with the different numbers of the stocks in use. The scrap from dieing out the blanks should be placed in these boxes.

Instead of being boxed and trucked the blanks may be run from the cutting room to the pressroom on a conveyor belt, provided the distance is quite considerable. They are run on the conveyor either in boxes or may be boxed on arriving in the pressroom. It is best to allow the box containing the heel blanks to travel along the belt conveyor, the same being taken care of on arrival at the pressroom.

CUTTING BLANKS FOR RUBBER HEELS
Courtesy of Boston Woven Hose & Rubber Co.

BALANCING HEEL BLANKS

In making heel blanks use is also made of the tubing machine. Dies are made covering the various sizes and styles of blanks desired and the stock is run through the tubing machine. It is cut off at convenient lengths, the shape being shown in the illustration.



The lengths of tubed stock are then placed against a rotary knife, which rotates at about the same speed as a circular saw. In fact, the whole apparatus resembles the action of a circular saw, the teeth being replaced by a knife edge. The knife cuts through at a, b, c, d, e, f, etc., forming the blanks. The thickness of the blanks is regulated by an adjustable rest on the side of the knife opposite the tubed stock. Water is played on the knife during the cutting operation; otherwise, the heat developed by friction is sufficient to draw the temper of the knife. The heel blanks are then placed in a current of waving air and the surplus moisture, which is on the surface of the blanks from the cutting operation, is driven off. They are then ready for the pressroom. This method saves the handling of a considerable amount of scrap.

An apparatus that is made in England, which has not been adopted in this country to any extent, cuts heel blanks, or any blanks, very rapidly. A rotating shaft carries the heel blank dies, which are similar to those used with the beam dinker. The stock, which is made up in similar manner to that for use on the beam dinker, is drawn into the machine; blanks are cut from it and the scrap is discharged. The cut blanks drop upon a belt conveyor and are taken to the pressroom. This machine has a very large capacity and is especially useful where there is a considerable number of blanks of one size and style to be cut. If the number of one size and style to be cut is small this machine loses its value.

(To be continued)

The Depolymerization and Oxidation of Raw Rubber*

I.—Importance of the Process of Depolymerization and Oxidation

In previous communications it has already been mentioned that the viscosity does not exclusively depend on the size of the particles, *i.e.*, the degree of polymerization, but also on their cohesion. But, as the latter itself depends on the size of the particles, " after a certain lapse of time, and at a constant temperature," the viscosity may virtually be accepted as a measure for the degree of polymerization.

After what has been stated respecting the signification of the viscosity, it will be clear that exterior circumstances may be of much importance on account of their influence on the degree of polymerization. A process of depolymerization always takes place in the factory before vulcanization, as well as when making rubber solution. Hence it is of interest to trace the causes and the course of the process.

In this respect it is, moreover, of importance to point out that van Rossem[1] has proved that " oxidation " of rubber can only begin when the viscosity has fallen below a definite figure, called the critical viscosity. This important fact was connected with the " tackiness " of rubber, about which he demonstrated that both polymerization and oxidation take place one after the other.

It is not to be denied that of late years the practical importance of the study of the tackiness has diminished. Whereas only some five years ago there appeared on the European market several wild rubbers, such as Congo and Castilloa, which often showed a strong inclination to become tacky, these brands are now chiefly supplanted by Hevea plantation rubber presenting this propensity in a much smaller degree. Moreover, by improving the work in the field, and also the manufacture of crepe and sheet, the chance of tackiness has been reduced to a minimum.

Tackiness, looked at scientifically, however, is a phenomenon the study of which remains of great importance.

II.—Depolymerization of Rubber

The following possible causes for the depolymerization of raw rubber are known:—(*a*) mechanical treatment; (*b*) heating; (*c*) exposure to light; (*d*) chemical influences. It is by no means excluded that other circumstances will be found having the same effect.

(*a*) Mechanical treatment. The influence of mechanical treatment cannot be entirely separated from that of heating, as during plasticating a considerable part of the kinetic energy of friction is transformed into heat. Efficient cooling, however, can cause the temperature to be only slightly raised so that its influence is small compared to that of the mechanical treatment. That the latter can occasion considerable depolymerization is evident from the investigations of numerous workers, *e.g.*, Boutaric, Gorter, Bernstein.

Bernstein[2] conducted his tests with rubbers whose botanical origin varied considerably, under exclusion of oxygen, and the depolymerization was measured with the viscometer of Frank-Marckwald. After prolonged treatment the same viscosity was found for the different rubbers. Bernstein even arrived at the same figure through the action of heat and of light. From this he drew the conclusion that different kinds of rubber finally arrive at an identical condition after having been subjected to all possible influences causing depolymerization. As measurements with the viscometer of Frank-Marckwald, especially with slightly viscous liquids, give very inaccurate results, it was found advisable to repeat the experiments with the capillary viscometer of Ostwald. Up to the present the Institute has only carried out tests on depolymerization through mechanical treatment, and notwithstanding their importance they are not yet complete. The following is a résumé of these preliminary experiments.

The viscosity of mechanically treated rubber, measured at a concentration of 1 per cent, decreases very rapidly after starting plasticating, which decrease becomes much slower after some time. At the expiration of the normal period of mechanical treatment, plasticating and mixing with sulphur on normally heated rolls taking about 10 minutes, the strong decrease of the viscosity may be taken as finished. Apart from the time of plasticating and the temperature of the rolls, their distance is probably of great importance for the velocity of the depolymerization process, as is evident from the experiments. Prolonged plasticating, up to 80 minutes, of two first latex crepe rubbers, with greatly varying initial viscosity, showed that the viscosity of the 10 per cent solutions had become identical (it having become very low, such a high concentration had become possible and also advisable for these determinations). This observation fully confirms the conclusion of Bernstein, as to the depolymerization through mechanical treatment for Hevea plantation rubber.

In connection with the preceding a few tests made at the Institute

* Communication of the Netherlands Government Institute for advising the Rubber Trade and the Rubber Industry established at Delft, and printed in the *India Rubber Journal*.

[1] *The Rubber Industry* (London, 1914), p. 149.

[2] *Kolloid-Zeitschr.* 12 (1913), 193.

about the same subject will now be dealt with, although the depolymerization was not so far pursued as in the preceding experiments.

Van Heurn has investigated in how far "washing" of raw Congo rubber is of influence on the viscosity. The washing was done with cold water and continued till the rubber was clean. It was notably essential as to which way the raw (moist) rubber and the washed rubber were dried, before the viscosity was measured, and that only drying in a vacuum desiccator furnished trustworthy results. For the perfectly dry rubber he found before washing, a viscosity-number of 117, and after washing 84, and concluded therefrom a considerable decrease.

Fol has investigated the influence of the viscosity of normal and too prolonged plasticating on the mixing rolls, together with possible influence of such treatment on the percentage of acetone extract, moisture, and ash. The results of the tests made with hard fine Para and with first latex Hevea crepe are to be seen in Table I, A and B.

TABLE I.

A.—Influence of Plasticating on Hard Fine Para.

	% Acetone extract.	% Moisture.	% Ash.	Viscosity No.
Washed and air dried	2.71	1.27	0.46	72.1
After 10 minutes plasticating	2.78	0.27	0.45	24.8
After 15 minutes plasticating	2.62	0.07	0.37	15.2

B.—Influence of Plasticating on F. L. Hevea Crepe.

	% Acetone extract.	% Moisture.	% Ash.	Viscosity No.
Raw product	3.62	0.43	0.31	49.6
After 10 minutes plasticating	3.57	0.19	0.55	20.4
After 15 minutes plasticating	3.66	0.14	0.53	16.4

The great influence of plasticating on slightly heated mixing rolls on the viscosity can be clearly detected in these tables, and it is also made evident that beyond the normal time of 10 minutes this influence is by no means finished. Whereas the percentage of acetone extract and of ash is not altered, that of moisture, on the other hand, is diminished, an occurrence which, as will be shown later on, is not without importance for the results of the vulcanization. When dealing with the vulcanization process the significance of the decrease in the viscosity will be further elucidated.

(*b*) Heating.—Rubber is depolymerized by heating in solution as well as in the solid state. The higher the temperature the more rapid this process. Numerous tests were made with a solution of about 1 per cent first latex crepe, heated at 130 deg. C. For the results one is referred to the preliminary communication by Van Rossem.[3] He disclosed and also confirmed for solid rubber the notable fact that the depolymerization of a rubber solution in the presence of oxygen takes place more rapidly than in the presence of other gases, such as carbon dioxide, hydrogen, and nitrogen. During the depolymerization no absorption of oxygen could be detected, although the apparatus was so constructed that even a slight absorption could be traced. Apparently the oxygen acts as a catalyst. Whether the oxygen has an accelerating effect on the polymerization through influences other than heating still remains to be tested, but may be taken as probable.

The investigation as to the influence of washing on the viscosity of Congo rubber by Van Heurn mentioned above afforded an opportunity of testing the result on the viscosity, caused by drying at 50 deg. C. If there was no sign of its influence, then his experiments could be considerably shortened, as drying at 50 deg. C. took only a few hours, while it lasted about two days in the vacuum desiccator. Moreover, a technical interest was attached to this test, as in the drying houses hot air is usually applied, and a diminishing of the viscosity during the drying process is most certainly considered to be inadvisable.

The rubber was cut up finely; one part was dried in a drying stove at 5 deg. C. for 3½ hours, and the other part was dried in a vacuum desiccator above sulphuric acid for two days (to constant weight). The remainder of the crepe was hung up for 13 days in order to give it the opportunity to recover. An average sample from this was cut up finely, one part was heated for five hours at 50 deg. C. in a drying stove, and the other part dried above sulphuric acid in vacuum for three days.

The viscosity numbers obtained with the different samples are to be found in Table II.

TABLE II.

Influence of Drying at 50 deg. C. on the Viscosity of Congo Rubber.

Congo rubber, raw product, dried in vacuum, viscosity number 117.
The same creped, immediately after washing, dried in vacuum, viscosity number 84; dried at 50 deg. C., viscosity number 68.2.
Same crepe, 13 days after washing, dried in vacuum, viscosity number 72; dried at 50 deg. C., viscosity number 60.5.

Van Heurn concludes from these figures that drying at 50 deg. C. diminishes the viscosity and consequently that drying at that temperature in general is not to be regarded as injurious, in opposition to Morgan,[4] who only found a decline in the mechanical properties (elasticity, recovery, etc.) after drying at temperatures above 50 deg. C. Yet Van Heurn is careful to point out that his tests were made with Congo rubber, whereas those of Morgan relate to Hevea Plantation Rubber. Further, that storing for 13 days does not improve the viscosity, but on the contrary causes a slight decline. It should, however, be noticed that the washed crepe was hung in a room with diffuse daylight, which may possibly have been of influence.

Another investigation by Van Heurn yielded some very remarkable results as to the influence of heating rubber, both in carbon dioxide as well as in air, on the degree of depolymerization. A sample of rubber was divided into three parts. The first part was retained as it was, the other two were each put into a glass cylinder through which a slow current of washed and dried carbon dioxide was conducted and which was heated in a drying stove. After the air had been fully displaced by the carbon dioxide heating was started, one part being heated for 4 and the other for 8 hours at 130 deg. C. After this, benzine solutions were made in order to carry out viscosity measurements. It was soon evident that whereas the original sample dissolved rapidly, both the heated parts left considerable residues behind, which did not change in quantity after 1½ days' shaking. This residue was especially considerable for the part heated for 4 hours and a trifle less for the one heated for 8 hours. The viscosity numbers of the rubber solutions were very low and are to be found in Table III.

TABLE III.

Influence of Heating in Carbon Dioxide at 130 deg. C. Before Dissolving.

Not heated, viscosity number 65.
Heated 4 hours, viscosity number 25.
Heated 8 hours, viscosity number 12.

In order to study the behavior of rubber on heating at a higher temperature than 130 deg. C. the following series of tests were made, this time with another crepe than the previous one.

About 300 grm. of Hevea crepe (viscosity number 80.7) was put into a stoppered bottle, through which a slow current of washed and dried carbon dioxide gas was conducted. The bottle was heated in a drying stove at 140 deg. C. and after resp. ¾, 6 and 12 hours, a small piece of rubber was taken out for the viscosity test. After heating for ¾ hour, the rubber dissolved readily,

[3] *The Rubber Industry* (London, 1914), p. 149.

[4] *The Preparation of Plantation Rubber* (London, 1913), p 107.

when making a 1 per cent solution. After 6 hours' heating an undissolved part was retained on the glass-wool filter, while the rubber heated for 12 hours, having become very tacky, dissolved better, but not completely.

The viscosity numbers are to be found in Table IV.

TABLE IV.

Influence of Heating in Carbon Dioxide at 140 deg. C. Before Dissolving.

Not heated, viscosity number 80.7.
Heated ¾ hour, viscosity number 39.3.
Heated 6 hours, viscosity number 18.9.
Heated 12 hours, viscosity number 10.2.

It also shows plainly here that the viscosity number, originally 80.7 declines continuously on heating, but again it must not be lost sight of that the insoluble portion which remains on the filter, may have contained highly viscous parts. Afterwards when dealing with Van Heurn's results on vulcanization of rubber heated in a current of carbon dioxide, it will be shown that this latter theory is indeed correct. The study of the influence of heating on the mechanical properties of rubber is of much importance, as it enables us to judge as to the action of the heat during the smoking process. As in this manipulation atmospheric oxygen can never be excluded, Van Heurn made another test by heating rubber in air. Hevea crepe was heated in a drying stove at 80 deg. C. as uniformly as possible. Half was taken out after one hour and the rest after 3 hours. The viscosity numbers are laid down in Table V.

TABLE V.

Influence of Heating in Air at 80 deg. C. Before Dissolving.

Not heated, viscosity number 62.4.
Heated 1 hour, viscosity number 58.5.
Heated 3 hours, viscosity number 53.5.

The viscosity numbers show a decline on heating, though not considerable. The heated rubber was not changed exteriorly, only it became somewhat more transparent. In connection with the preceding it should, however, be pointed out that the rubber heated in air dissolved completely in benzine, in contra-distinction to that heated in carbon dioxide. Consequently, there was no question of highly viscous rubber parts being retained on the filter before the viscosity number had been determined.

(*c*) Influence of light. The process of depolymerization is also very rapid under the influence of light. Reference has only to be made to Van Heurn's experiments, which proved that the decline of the time of running through the capillary-viscometer occasioned in diffuse daylight, does not take place as soon as the light is excluded.

Several tests have been made at the Institute with approximately 1 per cent solutions of rubber in benzine and xylene, which were exposed in quartz flasks to the action of ultra violet rays from a quartz lamp. These experiments will be published later on. The process of depolymerization appeared to move with an extraordinary velocity under the influence of ultra violet rays, both in the presence of air as well as in that of an indifferent gas (carbon dioxide).

(*d*) Chemical influences. There are in literature several indications pointing out that purely chemical influences can also considerably accelerate the process of depolymerization. Already in 1904 Harries[5] showed that after a rubber solution had been shaken with potassium permangate, the rubber did not return to its normal condition but appeared to be changed into a syrupy mass. He proved that the depolymerization had taken place, without the rubber having been oxidized. This very interesting observation has been confirmed at the Institute.

Reference must be made once more to the observation by Marquis and Heim,[6] afterwards made independently by Spence and Kratz,[7] that the viscosity of a rubber solution is strongly diminished through traces of acid. As already stated this was also confirmed at the Institute. Bernstein,[8] moreover, mentions that traces of bromine can lower the viscosity of a rubber solution considerably. At the Institute this was also noticed when applying the bromine method for the determination of caoutchouc. Finally, reference should be made to the observation mentioned in the beginning of this chapter, that at high temperatures the depolymerization is catalytically accelerated by oxygen.

Thus it will be noticed that very diverging chemical influences can occasion depolymerization, but a satisfactory explanation has not been found in any case.

(To be continued)

[5] *Ber. d. deutsch. Chem. Ges.* 37 (1904), 2708.

[6] *Bull. soc. chim.* (4) T. 13 and 14 (1913).

[7] *Kolloid-Zeitschr.* 14 (1914), 262.

[8] *Kolloid-Zeitschr.* 15 (1914), 49.

Information Exchange

Book on Specific Gravities

Inquiry from F. L. P., New Haven, Connecticut.—Can you recommend any book or publication containing tables of specific gravities of substances used in the rubber industry?

Worn Automobile Tires

Inquiry N. B. C., New York.—One of our foreign customers is in the market for large quantities of second-hand and worn automobile tire casings, which they wish to convert into soles for cheap footwear worn by the peasants in his country. Will you kindly give us names and addresses of firms from which we could buy these tires for our customer's account.

Tire Repair Equipment

Inquiry from C. W. W., New York.—We want to be placed in touch with a reliable concern manufacturing equipment for retreading worn-down tires and making general repairs to tire casings and inner tubes.

Scrap Rubber Buyers

Inquiry from F. E. C., Abilene, Tex.—Please put us in touch with large buyers of scrap rubber.

Flange Manufacturers

Inquiry from S. T. & V. S., Freeport, Ill.—Kindly give us names and addresses of concerns making side flanges such as are used in making wrapped tread tires.

List of Rubber Importers

Inquiry from J. S., Yokohama, Japan.—We would be greatly obliged if you could conveniently send us a list containing the names and addresses of rubber importers, particularly those handling druggists' sundries, toys and rubber specialties lines.

Composition Soles and Heels

Inquiry from T. C. H., Springfield, Mass.—Kindly place me in touch with manufacturers of rubber and composition soles and heels.

Cotton Stockinette Fabric

Inquiry from W. N. W., Los Angeles, Cal.—I am anxious to get into immediate communication with some manufacturers who can supply cotton stockinette fabric of much heavier weight than standard. I want stockinette or knitted fabric made from a heavy cotton yarn; I imagine a No. 6 yarn would be right. The fabric must be elastic in, at least one direction, and must be made from yarn that will stand a breaking test not under 16 and preferably 20 lb.

Lithophone and London Erda Compound

Inquiry from W. O. H. P., Mankato, Minn.—Will you kindly put us in touch with dealers in lithophone and London Erda Compound. We would prefer dealers close to Minnesota, for we believe New York to be too far away.

Technical Course in Rubber Manufacture*

By H. E. Simmons, M.S.

Professor of Chemistry in the Municipal University of Akron

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SECTION XII

Chemical and Physical Testing of Crude Rubber

As in the analysis of every substance, so in the analysis of crude rubber, the chemist must first obtain what may be regarded as a uniform sample. This, at first thought, seems a very simple matter, and yet it is one that causes as much if not more trouble than any other step in the complete analysis of any substance.

Very often there comes to our laboratory to be analyzed a sample of crude rubber varying in amount from a half ounce to five pounds. The party desiring to have the analysis made guards himself very carefully against telling anything about the history of the sample under consideration. Some very few are willing to reveal where they obtained the sample, but never as to how it was taken. The chemist must approach the analysis, therefore, absolutely ignorant as to the source, age, method of preparation, or as to whether it is a fair sample or not. The chances are in favor of its being a very misleading sample, just as liable to very good or very bad depending largely upon which party in the case involved took the sample. Therefore, a few general directions are necessary for the obtaining of what may be regarded as a uniform a test lot as possible.

Rubber comes into the market in extremely varying forms and lots. If you will recall how the various kinds of rubber are produced, you will realize how this comes about. Of course, the more uniform the rubber the easier it is to obtain a good sample and vice versa. The plantation rubber is, therefore, comparatively easy to sample. It will be remembered that the rubber comes into the market in the form of sheets, blocks or slabs, balls, spindles, thimbles, twists, sausages, scraps of every size and shape, biscuits, etc. Some shipments are small, others are large; some of the above forms are small and some large. It naturally follows, of course, that the smaller the forms and the smaller the shipments, the easier the task of sampling.

As an example, let us select a sample from a large shipment made up of many containers and the forms being rather large. Enough of the containers should be opened and thoroughly inspected to learn whether it may be regarded as a uniform shipment, that is, whether each package is a representative sample of the whole. If this is true, then a sample need not be taken from each package, but only from every other one or every third one. This, of course, is to be judged from the general appearance of the lot. If the forms are also running large, samples may be cut from representative ones taken. This will keep the volume of the sample down and at the same time not impair its uniformity. When cutting a ball or slab, it must be cut completely through. Some take a slice diagonally through the form while others take one through the middle perpendicular to the long axis. Ordinarily, sampling is not pleasant work and is, therefore, sadly neglected. A sample is wanted, some inexperienced help is sent to get it and he does so with the least possible expenditure of energy and thought. Too much emphasis cannot be placed upon this first and very important step in the analysis of rubber, or, in fact, any substance.

The sample having been obtained, the first thing to be done is to determine what is called the "washing loss." This will include in its per cent that due to moisture, dirt, and the soluble non-rubbers, which include proteins and carbohydrates. To determine the washing loss, the larger the sample taken the better; therefore, this test is better carried out on a factory scale than in the laboratory. A batch of rubber is first of all subjected to the washing process, just what method to be used depending upon the grade of crude rubber. If it comes in large, somewhat hard forms, it may be softened first in warm water and then cut up into suitable sizes to pass through the washer. The rolls are set rather far apart at first and water plays over them. As the rubber passes between the rolls, it soon takes the crepe form and the washing continues until the impurities are all removed. The rolls are gradually brought closer together so that a thin crepe may be obtained, thus enabling the rubber to dry more quickly. The thickness of these sheets vary greatly in different factories. After this it is dried and the loss in weight which it suffers, calculated in per cent of the original batch, represents the "washing loss."

This is a test which has great influence in determining the value of wild rubbers. On account of the cleanly methods of handling, the plantation rubbers run the lowest in washing loss while some grades of African run over fifty per cent washing loss.

A list of the more common rubbers with their average results of analysis will be given further along. If the determination has to be carried out on a laboratory basis, great care must be exercised in selecting the sample. Very misleading results may be obtained unless it is very carefully supervised.

From the analysis of crude rubber, not a great deal is to be gained. We shall present the tests ordinarily carried out in the order of their importance.

First, the moisture present in rubber must be determined. Moisture may cause a great deal of trouble in different manufacturing processes and, therefore, before being used, it must be thoroughly dried. This is a test which it is not necessary to carry out in the chemical laboratory very often, for a man with very much experience in handling rubber is soon able to judge as to the amount of moisture present in a sample, or at least as to whether or not it is dry enough to be used in compounding. If it is imperative to carry out this test in order to trace some trouble, then the best method consists in heating five to ten grams of the sample, reduced to as small parts as possible, in a vacuum oven until it comes down to a constant weight. This will require only a short time with some rubbers and a comparatively long time with others. Sometimes we see this test being carried out in an ordinary hot-air oven. Comparative results may be obtained by this method, but it is not to be recommended. The best and most accurate method consists in allowing the rubber to stand over sulphuric acid in a vacuum dissicator at normal temperature.

The tendency of rubber to oxidize with elevation of temperature must be guarded against. The unvulcanized rubber is less susceptible to this influence than the vulcanized, however.

Theoretically, we want to dry the rubber in the shortest possible time at the lowest temperature possible. This, of course, is effected by drying

* This course commenced in the July 10, 1917, issue of THE RUBBER AGE AND TIRE NEWS and will be complete in 28 issues.

in a vacuum, the temperature used being generally about 60 deg. C. If a hot-air oven must be used, 105-110 deg. C. is used. At this temperature and, in fact, at 60 deg. C., some rubbers running high in a flabby resin become very soft and tacky and it is hard to remove the last traces of moisture and likewise they are more apt to oxidize. To obviate the difficulty of oxidization, during the drying, Obach devised a method whereby he dried the rubber in a stream of dry carbon dioxide and then absorbed the moisture in a weighed U-tube containing sulphuric acid. This method determines the moisture directly, but is more or less difficult to control.

The per cent of moisture by whatever method determined, is calculated from the ratio of the loss during heating to the amount taken in the beginning. As a limit of water present in rubber for compounding, we may allow as high as 0.5 of a per cent. As before stated it is only necessary to perform this test occasionally to check up the efficiency of the drying system in use.

The next determination is the one, which is no doubt carried out more than any other, namely, the estimation of the amount of resin. The principle, upon which this determination is based, consists in extracting a known weight of the washed and dried rubber with a solvent which will remove the resin. Acetone is the one used. The solvent is then evaporated in a weighed flask and the resin thus determined.

To actually carry out this test you would proceed as follows: A weighed amount of rubber, which has been washed and dried, is placed in an extractor, and here we might say that the form used depends on the taste of the operator. Many different forms are on the market. Of course, the Soxhlet form is good and has been and still is used a great deal. The Wiley extractor has been used with considerable success. The writer, however, at present is using the Bailey-Walker form and is well satisfied with its results. The great advantage in it comes in its compactness and the fact that the solution of the resin in acetone does not have to be transferred to a tarred flask for weighing. The acetone used in these determinations should be freshly distilled off from potassium carbonate.

The larger the amount of rubber taken, the more accurate will be the result; therefore, let the size of the thimble in the extractor determine how much it is possible to take. The rubber is reduced to as small pieces as possible so that the maximum solvent action of the acetone is to be had. Some rubbers when treated in this manner and then subjected to extraction, become very soft and tend to flow together, thus making complete extraction impossible. In cases of this kind, the rubber may be sheeted out as thin as possible on a mill. Then a weighed ribbon of this is rolled up in muslin and placed in the extraction thimble. The extraction is then begun by heating the acetone in the flask either over a water bath or electric hot plate and continued for a period of ten hours. This is ample time for the extraction if the sample has been properly prepared and the necessary precautions taken. The acetone is then evaporated off over a water bath and the flask is heated for three hours in an oven held at 105 to 100 deg. C.

Here one must be very careful as some resins are volatile at this temperature and thus a loss might be encountered. In fact, it was observed in our laboratory this year that there were present in some rubbers resin which vould volatilize at just a few degrees above the boiling point of acetone. It is still an undecided question in the mind of the writer as to whether or not there are some which distill over with the acetone.

The per cent of resin is calculated on the basis of the rubber taken. The resin content varies within wide limits when we are considering all kinds of rubber, but varies within narrow limts for the same variety of rubber. For instance, Hevea will run about 3—4 per cent; plantation about 2—3 per cent, while Accra Lump will run from 30—40 per cent. The resins from South American rubbers are generally liquid and of a dark color. Plantation resins are also resins, but of a lighter color. The African resins are generally yellow and more or less brittle, but soften with heat.

The amount of resin in a rubber is not an absolutely reliable criterion as to the value of rubber for manufacturing purposes. Ordinarily the low resin content rubbers are best for the resin may be considered really as a diluent.

The next determination of value is that of ash. The principle of this determination consists simply in incinerating a weighed amount of washed and dried rubber and thus obtaining the amount of mineral matter in the sample.

To carry out this test, as large a sample as possible is used and weighed into a large shallow formed crucible of known weight. Heat is very carefully applied and regulated so that the volatile substances will not take fire. Should this happen, they may be easily extinguished by superimposing the cover over the crucible. When the volatile products are removed, the heat is increased up to that of dull redness and held there until all carbonaceous material has disappeared. The weight of the residue is then obtained and its per cent calculated on the basis of the rubber taken.

The ash content of rubbers does not, or rather should not vary within large limits. In fact, in the majority of rubbers, regardless of their source, the per cent should run from about 0.5 of one per cent up to 1.5 per cent. There are a few exceptions to this, however, and we find an ash as high as 3 per cent. The determination of the ash is of value for two reasons: First, it serves as a check upon the effectiveness of the washing process, for if it has been done hastily and incompletely, the ash will of necessity run high. Secondly, it serves as a means of detecting non-rubber materials. These four determinations are the chemical tests most frequently carried out and the ones upon which the verdict of the investigator is largely based.

Where a complete analysis is required, it becomes necessary to determine the proteids and other nitrogenous matter in the rubber. These cannot be determined directly, but we simply multiply the amount of nitrogen found by analysis by the factor 6.25. Not knowing the true nature of the rubber proteins, it is hardly necessary to say that this test does not furnish us with any reliable information. The test is carried out as follows: About two grams of rubber are weighed out and placed in a long-necked Kjeldahl flask, when 30 cc. of concentrated sulphuric acid and a drop of mercury are added. It is well to loosely cork the flask by putting a small funnel in the neck of the Kjeldahl. Heat is then applied to the flask, very carefully at first, until the first violent reaction has subsided. Then the heat is gradually increased until the acid boils quite vigorously. This is continued until the contents of the flask acquire a straw yellow color.

The solution is very cautiously diluted, and in some cases transferred into a larger flask, although the using of a large Kjeldahl in the beginning avoids this step. After dilution, one or two grams of sodium sulphide are added, then caustic soda, until the solution is distinctly alkaline. A few pieces of scrap zinc will prevent pounding when it comes to distillation.

The nitrogen of the original rubber has been converted into ammonium sulphate by the above treatment. Upon the solution having been made alkaline and upon the application of heat, ammonia will be distilled over into a known amount of N/5 sulphuric acid. When the ammonia is all driven over, the excess of acid is

titraced back with N/5 alkali, using methyl orange as an indicator. From the amount of acid consumed during the distillation, the amount of nitrogen in the rubber taken is calculated and from this the protein. The nitrogen in some unwashed rubbers may run as high as one per cent. Of this considerable is due to albuminoids which are present in the rubber, but which are soluble and would be removed upon washing. It is the albuminoid nitrogen, which undergoes putrefaction and imports to the rubber a bad odor. It also has a deleterious effect on the rubber. This albuminoid nitrogen is sometimes determined by determining the difference between the nitrogen in the unwashed and washed rubber. A small percent of nitrogen in rubber is a sign of strength rather than of weakness in the rubber.

The determination of insoluble matter is sometimes required. As the term implies, it includes those substances which are insoluble in the ordinary rubber solvents. Under insoluble matter, we find sand, clay, wood, humus, and other accidental impurities.

Theoretically it is an easy matter to treat a known amount of rubber with a solvent and weigh the residue, thus obtaining the insoluble matter, but the extreme viscosity of rubber solutions makes it a difficult matter to separate the insoluble from the soluble.

The methods employed give best results if the crude rubber is first milled when the pectus modification is broken down, and solution results more readily. A known amount of rubber is treated with either toluene or phenetol, the latter having been used by C. Beadle and H. P. Stevens. Even petrolium may be used and gives a solution, which may be filtered through a tared filter or centifuged and the residue determined.

The insoluble matter as a rule runs a little lower than the ash as some of the inorganic matter exists as salts which are soluble in the solvents used. The determination of rubber proper, or the pure hydrocarbon is generally obtained by difference, that is, the combined percentage of moisture, ash, organic protein, and acetone extract subtracted from 100. It may be determined directly, however. One or two grains of rubber are put into solution as indicated under insoluble matter and then allowed to settle of its own accord, or is hastened by centrifugal force. It is diluted up to 100 cc. and then 50 cc. are pipetted off and dropped into 100 cc. of warm alcohol, when the pure hydrocarbon is precipitated. To purify it the caoutchouc is precipitated several times, then dried in a weighed disk in a vacuum and its weight determined.

Instead of precipitating the rubber from the 50 cc. of solution it might have been transferred to a weighed flask, and the solvent evaporated off. The resin can then be removed by repeated washing with boiling alcohol under a reflux condenser. It may then be dried and its weight ascertained. The higher the resin content, the less accurate both of these methods.

Its determination by formation of the tetrabromide has been outlined by Spence and Galletly. They first dissolved a small amount of rubber in carbon tetrachloride. To this they added a reagent composed of 6 cc. of bromine and one gram of iodine in one liter of carbon tetrachloride, and allowed to remain about six hours. When this solution is added to alcohol, the tetrabromide is precipitated. It may be purified by dissolving it in carbon disulphide and reprecipitating it with petrolium ether. This may be repeated if necessary. The pure tetrabromide is then fused with a mixture of sodium carbonate and potassium nitrate. The residue is taken up in a small amount of water, nitric acid added, boiled and the silver halide determined. From this the amount of rubber proper is calculated. A great deal has been published concerning this method and it has its merits in principle at least, but in the hands of the writer, it has never given concordant results.

Schidrowitz and Goldsbrough (*J.S.C.I.*, 1909, p. 3) have called attention to some very interesting results from experiments upon the biscosity of rubber and its solutions. They point out that as is known, the viscosity of a liquid or of a solid contained in a liquid depends upon the state of aggregation of the molecules or physical aggregation. Therefore, the viscosity of rubber solutions should throw some light upon the chemical or physical state of aggregation in the rubber solution and this should give some idea as to the "nerve" of the rubber under consideration. The results of this work lead Schidrowitz to conclude that "Within the same species, viscosity measurements give a direct line as to strength and vulcanizing capacity. Comparing species with species, this does not hold good directly, probably because different species possess differently constituted molecules, and the relationship is, therefore, of a more complex order as between different specimens of the same species. At the same time the broad proposition holds good for all species, compared *inter se* or otherwise, that high viscosity figures indicate strength and low viscosity figures, weakness."

Specific gravity is sometimes determined, any one of the general methods for such work being employed. The information to be gained from this determination does not influence the judgment of the investigator to any extent. Only on rare occasions is it carried out on crude rubber, but it is used a great deal on vulcanized goods.

Another test, which has been suggested to be used upon both crude and vulcanized rubber, is known as the effect of "sun cracking."

To test the liability of rubber to sun crack requires a long period of time, and that, of course, renders the test almost useless because we do not have time to waste in waiting for a test that consumes a large amount of time. However, to obtain a test, which will show this property of the rubber, several artificial methods have been recommended. Weber subjected weighed samples of rubber, presenting the same area to the action of acetone peroxide for two days. The samples were then removed, dried, weighed, and the increase in weight was to be considered as a measure of the liability of the rubber to sun crack. He claims that the results obtained were in agreement with the actual results obtained by carrying out the sun-cracking test.

Ditmar tried to obtain a set of comparative results illustrating the same property of rubber. He placed in glass tubes weighed samples of rubber, then passed oxygen into these until the air was all excluded, when the tubes were sealed. These were then heated in a Carius furnace for from five to twenty hours at a temperature of 100 deg. C. The samples of rubber were then removed and weighed and their increase in weight he hoped to be a measure of the liability of the rubber to sun crack. He later modified his test by placing the rubber in a tube supplied with ground valves at each end and he maintained a constant temperature by lowering this tube into boiling water. Whether the results obtained are of much value is a question.

After all the above tests have been outlined and after a sample has been subjected to all of them, the question which would still remain unanswered is the one, which is perhaps oftenest asked by the manufacturer: How will the rubber conduct itself during vulcanization? It is true some general idea of this may be interpreted from the results obtained above, but the only conclusive information is to be gained by trying it.

In fact, some laboratories base their entire opinion of crude rubber

upon the information gained by actual vulcanizing and physical tests which follow.

A certain test formula is agreed upon and all samples of rubber to be tested are milled up according to this and then subjected to vulcanization at a certain temperature. Samples are removed at equal intervals and thus the rate of cure in the rubber may be obtained. Tensile strength strips may then be made and the physical tests carried out. These are the tests which interest the practical man. Little does he care whether a sample of rubber runs high or low in resins if it will cure in a short time and produce what he regards as a good stock. The technical man, on the other hand, is interested in trying to figure out the relation and influence of each of the above tests upon the product finally to be obtained in actual working conditions.

In addition to all the foregoing information, before final judgment is pronounced in regard to a given sample of rubber, its life history should be known: where it came from, how it was obtained, to what species it belongs, how it was coagulated, how it was stored, its form, color, odor, and many more questions of a similar nature.

With all of this knowledge before one, a proper conclusion in regard to the merits of a sample of rubber should be easily arrived at.

Below is a table taken from Caspari, which shows the relations of different rubbers in regard to the three most important tests:

Rubber.	Washing Loss.	Resin.	Ash.
Para Hard Fine, Acre			
Para, Bolivian Fine	16-21	2.5-3.5	0.2-0.4
Maaaos Scrappy	20-25	1.6-2.0	0.6-0.7
Para Negrohead, Sernamby	30-40	3.0-6.0	0.5-1.5
Cameta	45-50	1.4-1.8	0.5-0.8
Mattogrosso Virgin	18-22	2.5-3.0	0.5-0.7
Mattogrosso Negrohead	20-25	1.5-2.0	1.5-2.0
Mollendo Fine	15-20	1.8-2.0	0.2-0.3
Mollendo Coarse	12-18	2.0-2.5	0.3-0.4
Caucho & Peruvian Ball	20-30	3.0-5.0	0.5-1.5
Manicoba	25-35	2.8-3.0	3.0-4.5
Ceara Negrohead	20-30	4.0-5.0	1.0-1.5
Mangabeira	30-40	20-25	1.0-1.5
Central American	20-40	4.0-7.0	1.0-2.5
Guayule	22-26	20-35	1.0-1.5
Sierra Leone, Conakry, Massai, Soudan	15-30	5.0-7.0	0.4-1.0
Bassam, Cape Coast, Accra, Labou, Ivory Coast, Gold Coast	25-40	7.0-11	0.7-1.0
Second-Accra Lump, Saltpond	30-40	29-38	1.4-2.0
Gambia, Bissao	30-50	5.0-6.0	1.0-2.0
Gaboon, Loango, Congo Ball	25-35	8.0-18	0.6-1.0
Lagos, Niger, Penin	30-40	10-25	0.3-0.7
Batanga, Cameroon	25-35	10-15	0.5-1.0
Lower Congo, Wamba	10-20	5-6	0.5-1.0
Angola, Loanda, Benguela	25-40	5-7	1.0-2.0
Upper Congo sorts	5-15	4-10	0.5-1.5
Mozambique, Beira	7-15	5-8	0.1-0.8
Madagascar, Tamatave, Majunga	20-30	7-10	0.2-0.5
Assam	15-35	5-11	0.5-1.0
Penang	15-30	5-7	0.3-0.7
Borneo	35-45	10-11	0.4-0.6
Java Plantation	1-2	5-6	0.3-0.4
Ceylon and Malayan Plantation	1-2	2.5-3.5	0.2-0.6
Plantation Rambong	1-2	7-8	0.2-0.3

Brown Bast—New Rubber Disease

The Singapore correspondent of the Imperial and Foreign Trade Supplement of the London *Times* reports the discussion of a serious new rubber disease—brown bast, at a meeting of the Taiping District Planters' Association. Discussing the disease, one of the speakers said:

"To start with, it eats up the bark material and then strays over a very considerable area. The question arises, what is brown bast? Is it *Phytophthora Faberi* and, if so, why are its habits so peculiar? Brown bast seems first to attack the bark, use up all the best food, and, finally, enter the latex-bearing layer, and so on into the cambium. It is only when it enters the latex cells that it becomes noticeable to the tapper and those in charge by drying up the cut. The disease may have entered the cells anywhere, not necessarily on the cut, so that, when the tree is shaved for inspection, it is, as often as not, found that a large area is diseased.

"Brown bast may be in the tree for months before being discovered. A cut stopped near the collar for want of bark may have it only slightly, and not sufficiently developed to stop the latex there, but in time the disease spreads to the roots, where it is most difficult to treat, as it seems invariably to follow the taproot. The disease does not stop at the stem, but enters both the taproot and the lateral roots. In the greater number of cases it follows the taproot, which makes the disease exceedingly difficult to treat, because one has to go a great way down to cut the brown bast off. I do not profess to say what brown bast is, but it is generally supposed to be *Phytophthora Faberi*."

Another speaker made the statement that the Government had been asked to investigate the disease and publish the results in a bulletin.

High Pressure on Rubber Gloves

In a recent issue of the *Electrical World*, C. G. Brown, Laboratory Director of the Rochester (N. Y.) Railway & Light Co., states that all new rubber gloves received by the company are tested before they are placed in service, and in addition, receive occasional tests afterwards.

"The test is different from the ordinary one," says Mr. Brown, "in that 10,000 volts are applied while an ammeter is connected in series with the glove so that the current passing through the glove can be observed. Tentatively, all gloves are considered unsatisfactory if the current exceeds ten milliamp.

"One objection which has sometimes been raised to this test is that the glove might be weakened thereby, especially if the test is conducted frequently. To determine whether there was any ground for this objection, an ordinary glove which had been used considerably was subjected to 10,000 volts for twenty-six hours, at the end of which time it broke down at the surface of the water. As an effect was noticed just above the point of breakdown, which appeared to have been caused by corona, it seems probable that a brush discharge had been given off at this one point and that it was the gradual weakening effect of the brush discharge rather than the high tension applied to the glove which caused the breakdown.

"Following this test, the glove was returned to the water without being immersed quite so far and subjected to a similar test for 118 hours before it broke down the second time. The second failure started a fire in the upper part of the glove, so that it was impossible to examine it to see whether there were any small cracks in the glove or not.

"When it is realized that the part of the glove which is above water in this test is not a part which needs careful testing—in fact, if it is weakened there is no special damage done—and when it is considered further that the tests are not liable to be applied more than one minute or one and a half minutes a month, it should be evident that this method of testing is harmless, even if the experiments do not prove it."

Properties of Rubber Sponges

Because of its cellular structure rubber sponge has several very peculiar properties. For example: it has the lowest apparent specific gravity of all solid bodies, being around 0.05. In spite of its cellular structure it is water tight, and very nearly gas tight. While it is honeycombed with minute cells, each cell is an individual unit and the rate of diffusion of gases through it is comparatively low. Because of its low specific gravity it has a very low specific volume, which thus brings its cost within range for common purposes. Perhaps one of the most important uses to which it has been put is in the preparation of life preservers. It will not waterlog, is light, conforms easily to the lines of the body, and is not to be ruined by a pin prick. A life raft made with rubber sponge is as near fool-proof as one can be. All sorts of floating devices, such as buoys, markers, etc., may be improved by its use.—*Metallurgical and Chemical Engineering.*

New Sulphur Process

Sulphur, which in these war times costs from $55 to $60 a ton, can be manufactured for as little as $12 a ton by a process of reclaiming waste sulphurous smelter gases. This new process, known as the Thiogen wet process for recoveing sulphur from sulphur dioxide in smelter gases, has been the subject of an exhaustive investigation by the United States Bureau of Mines.—San Francisco *Argonaut.*

W. D. MOFFAT
PRESIDENT

W. I. SEAMAN
TREASURER

ROBERT BROWN
SECRETARY

THE RUBBER AGE AND TIRE NEWS

H. M. WILLIAMS
EDITOR

W. M. MILNER
ASSOCIATE EDITOR

PETER P. PINTO
MANAGING EDITOR

GEORGE NEWBOLD
BUSINESS MANAGER

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Special Brands

SPECIAL brands of rubber goods as well as of other commercial commodities are often classed as cheap, of poor quality, or as unreliable. Unfortunately this is too often the case and salesmen are wont to make much capital out of this point when selling branded goods to wholesale and retail dealers. It must be remembered, however, that some special brands are as good as some factory brands and are well maintained as regards quality and utility, while others are unreliable and tend to lower standards.

A brand, be it of a manufacturer or of a wholesale dealer who distributes it, is as good as the name and sincerity back of it. There are some jobbers' brands that are maintained on as high a level as good factory brands and the retailer or the consumer can place full confidence in them. There are other special brands that are as unreliable as some very inferior tires that bear factory brands. A brand in itself does not represent anything, but the continued good reputation of a brand means much.

Elsewhere in the Tire News section of this issue appears a statement in which strong advocacy is made of factory brands of bicycle tires, and in it reference is made to "the boom period of 1893 to 1900, when the specially branded tire was a practically unknown quantity." At that time, if memory serves right, there were factory branded tires which were offered to a clamoring public in great quantities and at prices which were more than inviting, but of quality so poor that the dealer who sold them heaved a sigh of relief when a purchaser of one of these hosepipe creations had safely rounded the corner without its coming off the rim.

These so-called tires were composed of little fabric, and less rubber. They were never overcured and seldom cured sufficiently to stand up, for limited facilities and almost unlimited demands forced some manufacturers of this grade of tires to work for production, to the utter disregard or disrespect of the meaning of the factory brand. In fact, some bicycle tires became so bad that the stopping of their manufacture became imperative for fear that all factory products would be judged by their factory branded bicycle tires.

Special brands in those days were fewer than they are today, for it was at about that period that hardware jobbers began to give serious consideration to the establishing and the maintaining of brands that would do credit to their institutions.

Manufacturers themselves are in some measure responsible for the desire of the jobbers to establish their own brands. At the time when many manufacturers did not protect their brands as well as they do now, and when those who did maintain quality were unwilling to grant attractive discounts to the wholesaler, the latter saw an opportunity of creating a new asset in the line of a tire bearing his own brand. A similar condition has existed in other lines, for had the tool manufacturers better protected the hardware jobber in discounts, there would have been little incentive for the establishment of some of the well-known jobbers' brands which have stood the test and have now become household names.

Trade Mark Classification of Rubber Manufactures

That a rubber manufacturer desirous of protecting his entire line of products by trade marks registration for a new or novel name or design is obliged to make twelve separate and distinct applications for trade mark registration is an anomaly of the existing classification of trade marks.

Tobacco products, glassware, crockery and earthenware, oils, greases and a great variety of other products are so classified that a single classification covers the entire field for them.

In rubber goods, the Patent Office classification appears to depend upon the particular article. For instance, rubber face-masks have two classifications, classes 22 and 24, and neither of these classes will in turn cover tires, belting, hose, or footwear.

When rubber manufacturers evolve a trade mark name or design that is distinctly new and novel, they should be allowed the privilege of using it freely on all their rubber products and they should be entitled to this under a single Patent Office registration as are manufacturers of other articles.

With the existing classification, the rubber manufacturer is at another serious disadvantage. In endeavoring to protect trade marks on rubber goods abroad he finds that foreign countries, follow, in many instances, the division demanded in the United States. This entails considerable expense where applications are required in a number of different foreign countries, as instead of one application, twelve applications per country are necessary.

The Commissioner of Patents should consider favorably the petition of the rubber industry, mentioned elsewhere in this issue, and alter the Patent Office classifications so as to permit a single trade mark registration to protect an entire line of rubber manufactures.

Rules and Regulations for Rubber Importations

In carrying into effect the President's import proclamation of Nov. 28, 1917, the War Trade Board has made arrangements with various committees selected by the trade and industrial organizations interested in the importation of certain commodities, which by the terms of the proclamation require import licenses.

Among the commodities coming under the provisions of the presidential proclamation are crude rubber (including gutta Joolatong), gutta percha, balata, gutta Siak, scrap and reclaimed rubber, and the War Trade Board has made arrngements with The Rubber Association of America, 17 Battery Place, New York, for controlling the importation and distribution of these products in the United States.

Prior to the date of the President's proclamation, all these materials were permitted by foreign governments to come into this country only if consigned to the consul-general of such governments, or some other designated representative, and were released to the importer only on the giving of certain guarantees that they would not be re-exported except under specified restrictions, or would not be used in trading directly or indirectly with the enemy, or would not be hoarded for speculative or other purposes. Under the present arrangement, the control formerly exercised by foreign governments over these commodities on reaching the United States will now be assumed by the United States Government, with the assistance of the Rubber Association of America through a committee this organization has appointed for the purpose.

The Rubber Association has just issued a bulletin embodying the rules and regulations covering the importations of crude rubber and kindred products, as approved by the War Trade Board on Dec. 7. Import licenses are required for all commodities covered in this bulletin, must be obtained by the importers from the War Trade Board and must be surrendered to the United States Customs authorities before taking delivery of the rubber. Blank forms of application may be obtained from the Bureau of Imports, War Trade Board, Washington, D. C., or any of its branches.

The Rubber Association's bulletin gives in detail the rules and regulations governing the import of crude rubber and kindred products, and is in full as follows:

Crude Rubber

DEFINITIONS.

1. Whenever the words "crude rubber" occur in this Bulletin, they are to be considered as denoting all varieties of rubber so known in the markets including gutta Joolatong (Pontianac) and also reclaimed and scrap rubber, gutta percha, and all kindred products, including balata and gutta Siak.

Wherever the terms "Manufacturer," "Dealer," "Importer," "Reclaimer," or "Person" occur herein, they are understood to mean:

Manufacturer: A person who purchases for his own manufacturing requirements and not for resale.

Dealer: A person who buys from an importer for resale.

Importer: A person who imports for his own account, or acting as agent, either for his own use in manufacture or for sale to either manufacturers, dealers, or other importers.

Reclaimer: A person who by manufacturing processes obtains crude rubber from scrap rubber.

Person: The word "person" shall also include a partnership and a corporation unless by the context that meaning is excluded

2. The United States Government, through the War Trade Board, has requested the Rubber Association of America, Inc., to act as consignee of importations of crude rubber from foreign countries, to be released only under the conditions set forth in the following paragraphs.

3. The Rubber Association of America, Inc., is undertaking this work at the request also of manufacturers, dealers, importers and reclaimers, who desire to avoid interruptions to their business, and it will be carried out in accordance with the request above mentioned and subject to and in compliance with certain regulations in respect thereto now or hereafter promulgated by the War Trade Board, and also subject to and in compliance with all provisions and agreements set forth and contained in Forms 1 to 4 inclusive hereto annexed and made a part hereof.

4. The Rubber Association of America, Inc., agrees with the War Trade Board to act for and on behalf of the War Trade Board in carrying out its plan and purposes in such manner as the War Trade Board may direct and request, and to supervise and keep itself posted as to the conditions in the rubber trade and as to the members thereof with a view to furnishing to the War Trade Board at any time such information as the Board may desire.

5. Manufacturers, importers, dealers and reclaimers are required to give through the Rubber Association of America, Inc., to the War Trade Board, certain undertakings required by the War Trade Board, forms of which are annexed hereto.

6. For the purpose of facilitating this work, the Rubber Association of America, Inc., has appointed a Committee on Rubber and Kindred Products, which will act in an advisory capacity to the War Trade Board and have charge of these matters on behalf of the association. This committee is composed of the following members: Charles T. Wilson, chairman; H. Stuart Hotchkiss, B. G. Work, Henry Spadone, William E. Bruyn, G. B. Hodgman, W. J. Kelly, E. H. Huxley, H. S. Vorhis, secretary.

7. All importations of crude rubber from foreign countries are to be consigned to the Rubber Association of America, Inc. (with marginal bill of lading clause reading): Notify (here state the name of importer).

8. All bills of lading, together with the invoices, and other documents, should be sent by the foreign shipper, through the regular trade or commercial channels, to the parties by whom the crude rubber is purchased, or for whose account the crude rubber is shipped, and in no case to the Rubber Association of America, Inc.

9. Upon receipt of documents by the importer or recipient in this country, the bills of lading are to be presented to the Rubber Association of America, Inc., by the importer, accompanied by an undertaking and guarantee in one or more of the forms hereto annexed, approved by the War Trade Board:

Form No. 1—Importing Manufacturer's Guarantee.

Form No. 2—Importer's and Manufacturer's Guarantee combined.

Form No. 3—Rubber Reclaimer's and Scrap Rubber Importer's Guarantee combined.

Form No. 4—Agreement by Importer.

All applications for the release of importations of crude rubber under the above-mentioned guarantees will be received by the Rubber Association of America, Inc., at its office in New York or at any of its branch offices that may at any time be established.

10. Representatives of the Rubber Association of America, Inc., will be appointed at New York and San Francisco clothed with Custom House Power of Attorney for the endorsement of bills of lading as required by the United States Treasury regulations. These representatives will endorse bills of lading covering importations of rubber consigned to the Association only when the guarantee requirements under Clause 9 have been sat-

Form No. 1

License No.....

Importing Manufacturers' Guarantee

Ex S. S.....

Packages.....

Weight.....

Quality.....

Marks.....

THE WAR TRADE BOARD,
Washington, D. C.

In consideration of your consenting to the delivery to us of the

Crude Rubber
Gutta Percha
Balata
Gutta Siak

specified in the margin, we

hereby give you the following undertaking which shall remain in force so long as the United States is at war with any European Power:

1. We will not export from the United States any crude rubber (including gutta joolatong), gutta percha, balata, gutta siak, scrap or reclaimed rubber, without an export license from the War Trade Board.

2. We will not sell the

now delivered by you, nor any crude rubber (including gutta joolstong), gutta percha, balata, gutta siak, scrap or reclaimed rubber to any person in the United States, but will use it for our own manufacturing purposes.

3. We will not execute any orders for manufactured or partly manufactured goods containing any of the above mentioned commodities to be sent either directly or indirectly to any country or state at war with the United States or any of the allies.

4. We will not export any manufactured or partly manufactured goods containing any of the above mentioned commodities except under license duly issued by the War Trade Board, nor will we sell or ship any manufactured or partly manufactured goods containing any of the above mentioned commodities to any person in the United States without satisfying ourselves that there is no intention on his part to export or resell same for exportation save under an export license duly issued by the War Trade Board.

.....

.....

Date.....

Form No. 2

License No.....

Importers' and Manufacturers' Guarantee Combined

Ex S. S.....
Packages.....
Weight.....
Quality.....
Marks.....

THE WAR TRADE BOARD,
Washington, D. C.

I beg to inform you that I have sold the

Crude Rubber
Gutta Percha
Balata
Gutta Siak

specified in the margin, to

.....

whose guarantee you will find on the back hereof. I will produce to you at any time on demand the original contracts or other documents evidencing the sale.

In consideration of your consenting to the delivery to them of the said rubber, I undertake that I will not directly or indirectly at any time, so long as the present war continues, export any crude rubber (including gutta joolatong), gutta percha, balata, gutta siak, scrap or reclaimed rubber from the United States except under an export license duly granted by the War Trade Board.

.....

.....

Date.....

Form No. 2

THE WAR TRADE BOARD,
WASHINGTON, D. C.

In consideration of your consenting to the delivery to us of the

Crude Rubber
Gutta Percha
Balata
Gutta Siak

specified on page 1, which we have purchased from

I/we

hereby give you the following undertaking:

1. We will not export from the United States any crude rubber (including gutta joolatong), gutta percha, balata, gutta siak, scrap or reclaimed rubber, except under an export license duly issued by the War Trade Board.

2. We will not sell the now delivered by you, nor any crude rubber (including gutta joolatong), gutta percha, balata, gutta siak, scrap or reclaimed rubber, but will use it for our own manufacturing purposes.

3. We will not execute any orders for manufactured or partly manufactured goods containing any of the above mentioned commodities to be sent either directly or indirectly to any country or state at war with the United States or the allies.

4. We will not export any manufactured or partly manufactured goods containing any of the above mentioned commodities except under license duly issued by the War Trade Board, nor will we sell or ship any manufactured or partly manufactured goods containing any of the above mentioned commodities to any person in the United States without satisfying ourselves that there is no intention on his part to export or resell same for exportation save under an export license duly issued by the War Trade Board.

.....

.....

Date.....

isfactorily complied with, and the endorsement of such bills of lading has been properly authorized.

11. It is the duty of importers and purchasers governed by these arrangements when negotiating for fire and marine insurance to have substantially the following clause in their policies:

"In case the assured holds the property covered by this policy under an agreement with the War Trade Board, it is mutually understood and agreed between the Company and the assured that in the event of a loss occurring as a result of which the Company shall take over any part of or all of the property insured hereby, then the company shall be bound by the same terms and conditions of the agreement held by the assured with the said War Trade Board."

12. Frequenly shipments arrive before documents. The shippers should, whenever possible, mail a signed bill of lading, one stamped consular invoice, and copy of the commercial invoice, on the vessel carrying the shipment.

13. On shipments arriving before the bills of lading are received, the Rubber Association of America, Inc., will assist as far as possible in overcoming difficulties

Form No. 3

License No.....

Rubber Reclaimers' Guarantee

Ex S. S.....
Packages.....
Weight.....
Description.....
Marks.....
Bought From.....

THE WAR TRADE BOARD,
Washington, D. C.

In consideration of your consenting to the delivery to me of the rubber specified in the margin, I undertake that I will not directly or indirectly at any time, so long as the United States is at war with any European country, export from the United States any crude rubber (including gutta joolatong), gutta percha, balata, gutta siak, scrap or reclaimed rubber, except under license from the War Trade Board.

I will not sell any crude rubber (including gutta joolatong), gutta percha, balata, gutta siak, scrap or reclaimed rubber, for exportation save in case of persons to whom export licenses have been issued by the War Trade Board.

I undertake that I will not sell any scrap or reclaimed rubber to any person in the United States without satisfying myself that the purchaser has signed one of your approved forms of guarantee or that he intends to use it for his own industrial purposes only.

.....

.....

Date.....

Form No. 4

License No.....

Scrap Rubber Importers' Guarantee

Ex S. S.....
Packages.....
Weight.....
Description.....
Marks.....

THE WAR TRADE BOARD,
Washington, D. C.

I beg to inform you that I have sold the Scrap rubber specified in the margin to

.....

whose guarantee you will find on the back hereof. I will produce to you at any time on demand the original contracts or other documents evidencing the sale.

In consideration of your consenting to the delivery to them of the said rubber, I undertake that I will not directly or indirectly at any time, so long as the present war continues, export any crude rubber (including gutta joolatong), gutta percha, balata, gutta siak, scrap or reclaimed rubber from the United States except under license duly granted by the War Trade Board, nor sell any crude rubber (including gutta joolatong), gutta percha, balata, gutta siak, scrap or reclaimed rubber for exportation, save in case of persons to whom export licenses have been duly issued by the War Trade Board.

.....

.....

Date.....

due to the absence of the bills of lading. The extent of this assistance will be to furnish the importer with a release with a notice to the Collector of Customs and the steamship company which will enable the importer (after satisfying the Collector of Customs and the steamship company of his interest) to obtain delivery by furnishing an import license and a bond to produce the bills of lading later. This is a customary practice in such cases.

14. A record will be kept of all importations of rubber released under the guarantees as indicated, which will show the particulars of importation indicating the shipper, the importer and the manufacturer, to whom the rubber has been released, and any other data necessary to indicate its final disposition and consumption. This record will be checked from time to time by government inspection of and comparison with the books and records of the manufacturers, importers, dealers and reclaimers.

15. The War Trade Board at intervals may require reports from manufacturers, importers, dealers and reclaimers showing stocks on hand at a given period, actual consumption and other particulars. These reports will be confidential and will be compiled by the statistician of the Rubber Association of America, Inc., for the information of the War Trade Board or any other department of the U. S. Government. With this information as a basis, modifications or changes may be made from time to time in the regulations and practice controlling the importations, allotment and distribution of supplies of rubber so that the best interests of the manufacturers, importers, dealers and reclaimers and of the country may be properly served. The association will also use its best efforts to provide for a distribution of imports upon an equitable basis, primary consideration being given to the requirements or necessities of the government program.

16. From a perusal of the above and of the guarantees annexed, it will be noted that the substantial modifications and readjustments to be effected are as follows:

(*a*) The consignment of all crude rubber, irrespective of its origin, to the Rubber Association of America, Inc.

(*b*) The necessity of obtaining an import license before the commodities mentioned in this bulletin can be imported and the further necessity of securing an export license before any exportations can be made irrespective of destination.

(*c*) Hereafter all importations of crude rubber must specify the Rubber Association of America, Inc., as the consignee, and importers should immediately notify foreign shippers of this necessity. This applies also to applications for license for export to the United States made to the Rubber and Tin Exports Committee of London.

(*d*) No changes except as herein indicated in the general practice heretofore followed by importers and manufacturers in clearing their rubber through the Rubber Association of America, Inc., or in arrangements for storage, are now contemplated.

17. *Charges:* The charges to be made for services rendered by the Association in registering imports and arranging for storage, are to continue as heretofore.

A schedule of these charges is given below for the information of those unfamiliar with the same.

Registering Plantation and Wild rubbers in cases or bales (up to a weight of 500 lbs.), 5 cents per case or bale. Casks, cases or bales in excess of 500 lbs., 15 cents per cask, case or bale.

Arrangements for storage of same, 15 cents per cask, case or bale, irrespective of weight.

Registering Scrap or Reclaimed rubber, 50 cents per ton.

Form No. 4

Agreement by Importers

(This agreement should be executed by the importer and attached to the first import license made to the War Trade Board.)

WHEREAS, the undersigned is desirous of importing from time to time crude rubber and of procuring licenses for such importations from the War Trade Board, and

WHEREAS, The Rubber Association of America, Inc., is undertaking at the request of the War Trade Board certain work in connection with such importations,

NOW THEREFORE, the undersigned agrees in consideration of services rendered by The Rubber Association of America, Inc., and of the issuance to him from time to time of licenses by the War Trade Board as follows:

1. Neither The Rubber Association of America, Inc., nor any officer, member, or committee thereof, shall be in any way liable for the withdrawal at any time of any facilities for importing crude rubber (including gutta jolatong), gutta percha, balata, gutta siak, scrap or reclaimed rubber, or for any action on its part in connection with any of the duties undertaken by it.

2. In the event of conditions arising in connection with any particular shipment or shipments of crude rubber in which I/we may be interested as a manufacturer, importer, dealer or reclaimer, or otherwise, and which may render it desirable, in the opinion of The Rubber Association of America, Inc., that the delivery of said crude rubber (including gutta jolatong), gutta percha, balata, gutta siak, scrap or reclaimed rubber, shall be withheld or refused, The Rubber Association of America, Inc., may refuse or withhold delivery of said crude rubber (including gutta jolatong), gutta percha, balata, gutta siak, scrap or reclaimed rubber, and the case may then be presented for determination to the War Trade Board, whose instructions in the premises, The Rubber Association of America, Inc., may carry out without incurring any liability whatsoever.

3. I/We will conform to the requirements, regulations, and provisions set forth in Bulletin No. 1 of The Rubber Association of America, Inc., and any changes or amendments which may be made to such regulations hereafter.

4. I/We will give you the required guarantee on all importations or purchases of crude rubber made by me/us.

5. I/We will furnish statements as required of all sales made by me/us and take guarantees as required from my/our customers.

6. I/We will make the required statistical reports from time to time when called upon to do so.

7. I/We will indemnify and hold harmless The Rubber Association of America, Inc., and/or its officers individually and/or collectively, and the Committee on Rubber and Kindred Products individually and/or collectively from all liability in connection with any importations or dealings in crude rubber (including gutta jolatong), gutta percha, balata, gutta siak, scrap or reclaimed rubber, entered into by me/us.

.....
(Signature of Applicant.)

Witness.....

Arrangements for storage of same, 50c per ton.

Registering charges to be paid by the manufacturer but collected by the Association from the importer at the time of registration.

Charges for arranging for storage to be paid by the importer.

Regulations Relating to Guarantees

The Rubber Association, through its secretary, Harry S. Vorhis, has issued to the trade the following circular letter explaining the regulations relating to the fulfilling of guarantees:

Pending further instructions from the War Trade Board the regulations that have been in use for a considerable time relating to the fulfilling of guarantees will continue, and for the information of such manufacturers, importers, brokers and dealers who are not thoroughly familiar with them they are given herewith.

I—Signing and Filing of Guarantees

Manufacturers may sign guarantees furnished them in blank. The signature must be accompanied by the corporation seal in the case of a corporation, or signed by a partner in the case of a copartnership.

If manufacturers so desire they may lodge such guarantees signed in blank with the importers with whom they deal, or they may lodge them with the Rubber Association of America, Inc., as trustee.

In case such guarantees are filed with the Rubber Association of America, Inc., the secretary shall only give such guarantees to importers for their signatures upon importers furnishing him with typewritten particulars of marks, numbers, quantities, and grades of consignments, together with the names of the steamships by which they arrive, which information shall be placed upon the guarantees before they are released for the importer's signature.

II—Proof of Delivery of Rubber

Each shipper of rubber to a manufacturer or dealer for the purpose of showing proof of shipment shall lodge with the secretary of the Rubber Association of America, Inc., within a reasonable time (the limit being ten days) a signed copy of the bill of lading from the transportation company, or a signed copy of the delivery of receipt from those receiving the rubber with the gross weight indicated thereon.

The secretary is also to send to each manufacturer a notice describing the goods covered by each guarantee lodged with the association. To said notice a receipt form is attached which is to be signed by the manufacturer as soon as the rubber is received, and returned to the secretary. In this way check is kept on all arrivals at all ports of entry in the United States and actual deliveries to manufacturers are verified.

Should the importer upon examination of the rubber find that it is necessary for him to distribute it to manufacturers other than those whose guarantees were originally lodged, it becomes such importer's duty to notify the secretary immediately of any such changes in disposition and lodge new guarantees for the manufacturers to whom the rubber will actually be shipped.

In this connection it may be that considerable difficulty has been experienced by the Association heretofore by reason of importers not promptly notifying the secretary of such changes in disposition. In the future changes in the disposition of consignments of rubber must be promptly reported to the secretary, who will be unable to handle importers' documents until complete records of such changes in disposition have been furnished.

III—Rejected Rubber—Notice to Secretary

The attention of manufacturers and importers is called to the fact that they are held strictly accountable for all rubber released for their account and that in all cases of rejection of shipments of rubber in whole or in part, the manufacturers are bound to notify the secretary of the Rubber Ass'n of America, Inc., immediately.

In such cases the secretary must receive promptly from the seller of the rubber either a new guarantee from a new customer for the delivery of the rejected rubber to them, or the seller must put the parcel in store (pending the resale of same) with the Rubber Association of America, Inc., for his account.

IV—Storage of Rubber

Where consignments of rubber arrive unsold and the importer desires to store same in whole or part, an agreement relieving the Ass'n of any liability for acting as custodian should be executed.

News of Interest to the Rubber Industry

Incorporation of L. H. Butcher Co.—Ajax to Add to Plant—Armstrong Increases Capital Stock—Rubber Rates Increased—Star Rubber Co.'s Chicago Branch

L. H. Butcher Co. Incorporated

L. H. Butcher Co., New York and San Francisco, established in 1890, has been incorporated under the laws of New York to deal in colors, chemicals, minerals and industrial ores. Principal offices are located at 100 William Street, New York City. The officers are S. L. Schwartz, president; J. E. Schwartz, vice president, both of San Francisco, and Virgil G. Thomas, of New York, treasurer and secretary.

Hayes Joins L. H. Butcher Co.

W. S. Hayes, for several years New York manager of the Lennox Chemical Co., manufacturing chemist in Cleveland, Ohio, has joined the forces of the L. H. Butcher Co., 100 William Street, New York, manufacturer and dealer in chemicals, colors and filers for the rubber industry.

Rubber Exports from Straits Settlements

According to Henry Campbell, United States Consul at Singapore, rubber to the value of $70,298,454 was exported from the Straits Settlements for the first six months of 1917. As practically all the imports of rubber to the Straits Settlements originate in the Malay Peninsula, the total exports represent the total production of the peninsula. Rubber production has grown tremendously in the peninsula in the last two or three years, the exports for 1917 being 54 per cent greater than the exports for the same period last year which amounted to $45,474,841.

Stungo-Radium Reorganized

Stockholders of the Stungo Radium Rubber Co., Washington, Pa., held a meeting recently and reorganized the company, which was in financial trouble some time ago. It is now known as the Washington Rubber Co.

No Heavy Work for Women

At a meeting of the State Welfare and Efficiency Conference held at Harrisburg, Pa., on Nov. 28, the question of the employment of women in all industries was discussed, and it was the concensus of opinion that they should not be called upon for heavy work.

Dyett Represents Wire and Cable Section

H. T. Dyett, president of the Rome Wire Co., Rome, N. Y., has been appointed as member of the Underwriters' Laboratories Industry Conference for Rubber Covered Wire and Cords. Mr. Dyett was nominated as one of the three manufacturers' representatives on the conference at a recent meeting of the Wire and Cable Section of the Associated Manufacturers of Electrical Supplies. He succeeds the late John C. Bridgeman, of the Hazard Manufacturing Co. The other manufacturers' representatives are Leroy Clark, president of the Safety Insulated Wire Co., and Everett Morss, president of the Simplex Wire & Cable Co.

Apsley Declares Dividends

Apsley Rubber Co. has declared the regular semi-annual dividend of 3½ per cent on the preferred stock.

National India Rubber Co. Increases Pay

A 10 per cent bonus, which the National India Rubber Co., Bristol, R. I., has been paying to its employes for the past year, has been made permanent and an increase in pay to the piece workers has also been granted.

Kleinert Rubber Receives War Contract

The I. B. Kleinert Rubber Co., New York, has received an award for furnishing medical supplies for the army from the Surgeon General of the Army. The contract is for 5750 yds. of gas mask material at a cost of $9,846.88.

Converse Declares Dividend

The Converse Rubber Shoe Co. has declared a 3½ per cent. semi-annual dividend on its preferred stock.

Hotel Accomodations for Automobile Week

New York's hotel facilities will be taxed to capacity during Automobile Show Week, and for this reason the Rubber Association of America, 17 Battery Place, wishes to advise their members that reservations should be made as soon as possible, should accommodations be desired for the night of the association's banquet, Jan. 7.

All rooms at many of the leading hotels have already been reserved, and should anyone be unable to secure accommodations at his usual hotel, the Rubber Association will attempt to secure a room upon request with a statement of his requirements.

Alpheus Hardy Dead

Alpheus Hardy, at one time head of the firm of Alpheus Hardy & Co., merchants in the India trade, died at his home, 445 Beacon Street, Boston, Mass., on Dec. 19.

Armstrong Increases Capital

The Armstrong Rubber Co., Trenton, N. J., recently filed notice of an increase in its capital stock to $1,500,000. This sum is to be divided into 90,000 shares, of which 50,000 are to be common stock of a par value of $10 each, and 40,000 of which are to have a par value of $25 each. George F. Armstrong is president of the company. It has offices in Newark.

Rex-Hide Installing Laboratory

The Rex-Hide Rubber Manufacturing Co., East Brady, Pa., is now installing a complete laboratory for research and experimental work, and expects to further improve the standard of its fiber soles and toplifts. A. B. Kempel, general manager of the company, and C. L. Brickman, its chief chemist, are confining themselves exclusively to the development of this line.

Ernst A. Korn Sells Interest

The interests of Ernst A. Korn in the business conducted by Henderson & Korn, 82 Beaver Street, New York City, have been sold to Francis R. Henderson, and the business will be conducted under the trade name of F. R. Henderson & Co.

Star Rubber Co. Opens Chicago Branch

The Star Rubber Co., Akron, Ohio, announces the opening of a Chicago office at 1720 Michigan avenue. This new branch is in charge of Eddie Merkel, formerly with the Federal and Knight companies. It is to sell only to dealers and will be maintained as part of the Star Rubber factory service.

Another branch at San Francisco to help Pacific Coast dealers is contemplated.

Increase in Rates on Rubber Shipments

The war has increased the rate of crude rubber shipments from the ports of Singapore and Penang to the Pacific coast from $24 to $95 a ton. The Straits Settlements furnish about seventy per cent of the rubber supply, of which the Akron factories use about one-half.

AN ATTRACTIVE DISPLAY OF DRUGGISTS' SUNDRIES
Photo Fashion Camera Studios

News of the Rubber Metroplis

Firestone Stockholders Meet—Goodyear Girls Have Military Organization—Change in Firestone Sales Plan—More Goodrich Guide Posts—Rubber Companies Help Y. M. C. A.

Firestone's Annual Meeting

Several thousand stockholders gathered in what was among and perhaps the most largely attended meetings of stockholders ever held in the United States at the annual meeting of the Firestone Tire & Rubber Co. held in Akron on Dec. 15. More than 95 per cent of the stockholders present were officers and employes of the company. The meeting elected directors for the ensuing fiscal year and transacted other business.

This was one of the most impressive and significant business sessions in the history of the company. It placed the stamp of success upon a plan so original and broad in its cooperative spirit as to have caused nation-wide comment when adopted a year ago.

The activities of the tire factory stopped and offices suspended business, while the employe-stockholders marched with their executives and other stockholders from the main building to the Firestone club-house to elect the company's governing board for the coming year.

The large auditorium of this building was the scene of the meeting, and when the thousands of interested stockholders had filled it to the walls, the overflow of nearly another thousand assembled in the dining room below.

President H. C. Firestone presided and in his preliminary remarks spoke of his satisfaction over such a successful culmination of his plan of cooperative ownership and expressed his appreciation of the deep interest in and broad understanding of his aims and purposes, as demonstrated by so full an attendance.

"While we are in the throes of this great war," said Mr. Firestone, "we must use every atom of our intelligence and every sinew of our strength, individually and collectively, to hasten victory and peace. We must not think much of such sacrifices as we must make. Those of us who are here and have not yet been called upon to make the sacrifice of being in the trenches, must produce everything in our power to make our country efficient, strong and prosperous.

"I am glad indeed that the Firestone salesmen from all over the country, 500 strong, are here with us. It will be an inspiration to them to see you all here and to realize that it is these stockholders who are building the tires that they sell. Now, before getting into formal matters let me urge that every man cast his vote with the number of shares he owns."

The treasurer's report was loudly applauded. It showed that the total assets were $51,633,697.43 and the total surplus was $26,122,824.83.

In Mr. Firestone's report he announced sales last year of $61,587,219.29, which is an increase of 71 per cent over sales of the previous year.

Following is the consolidated general balance sheet of The Firestone Tire & Rubber Co. and its proprietary companies as of Oct. 31, 1917:

Assets		
Lands, buildings, machinery and equipment ..... Net sound book value.		$16,597,362.10
Investments in securities.		
United States "Liberty Loan" bonds	$500,000.00	
Miscel'neous stocks and bonds.....	1,200,647.56	
Total investm'ts in se:urities		1,700,647.56
Liquid assets:		
Finished and in-process goods and materials and supplies inventoried at cost	$14,034,626.48	
Cash	2,452,839.87	
Notes and accounts receivable	11,817,421.64	
Total liquid assets.....		28,304,887.99
†Due from employes on account of common capital stock purchases and sundry advances.. The capital stock purchases are secured by deposit of stock as collateral.		4,835,134.80
Expenditures applicable to future operations		195,664.98
Total.....		$51,633,697.43
Liabilities		
Preferred, 6%, cumulative capital stock ..... Authorized issue $10,000,000.		$8,500,000.00
Common capital stock..... Authorized issue $5,000,000.		3,500,000.00
Current liabilities:		
Notes payable for borrowed money	$9,715,000.00	
Accounts payable	838,666.75	
Accrued salaries and wages, real and personal taxes, etc.....	314,281.32	
Total current liabilities. ..		10,867,948.07
Subscription to United States "Liberty Loan" bonds.....		490,000.00
Reserves:		
For welfare work and pensions...	$1,100,000.00	
For insur. losses.	284,996.23	
For Federal income and war excess profits taxes	767,928.30	
Total reserves.....		2,152,924.53
Surplus		26,122,824.83
Total.....		$51,633,697.43

NOTE.—The Firestone Tire & Rubber Co. had a contingent liability with a corresponding asset as endorser on $187,495.85 of notes receivable discounted.

† In accordance with a resolution passed by the stockholders at their annual meeting, held on Nov. 2, 1916, 50,000 shares of common capital stock was authorized to be sold to employes. Subscription books were opened on Jan. 2, 1917, and closed on March 8, 1917, during which time 90 per cent, or 11,300 out of approximately 13,000 employes, became stockholders.

VIEW AT FIRESTONE'S ANNUAL MEETING

Goodyear Girls Perfect Military Organization

It is announced that the girls of the Goodyear Tire & Rubber Co. branch of the Y. W. C. A., Akron, Ohio, have perfected a military organization. Although it is not expected that Uncle Sam will permit them to emulate the example of their brave sisters in the Russian "Battalion of Death" in actual military service, their determination to keep up with the spirit of the time has led them to ask for military instruction. The girls drill each week under the instruction of the Goodyear drill master.

Goodrich to Erect More Guide Posts

The B. F. Goodrich Rubber Co., Akron, Ohio, is planning the erection of many more miles of guide posts.

Goodyear Leads in Y. M. C. A. Drive

In the recent drive for the Y. M. C. A. fund the teams from the Goodyear, Goodrich, Firestone and Miller Rubber plants were among the most successful. The following are the totals from these companies: Firestone, $22,146.55; Goodrich, $19,517.82; Goodyear, $22,899.68; Miller, $9,044.15.

Change in Firestone Selling Plan

A change has been made in the selling plan of the Firestone Tire & Rubber Co., in respect to its demountable rims and wheels for Ford cars. Hereafter orders for such equipment are to be filled direct by jobbers instead of by the Firestone branches as heretofore.

Goodrich Buys Thrift Stamps

It is announced that the B. F. Goodrich Co., Akron, Ohio, has purchased $22,000 of thrift stamps. It is the intention of the company to give all its employes a thrift card with one dollar in stamps attached, and each employe will be expected to fill the card.

Activities of the Rubber Association

Trade Mark Classifications of Rubber Goods—Annual Meeting and Banquet —Rubber Men Help Airplane Production—War Service Committee Appointed

Trade Mark Classifications of Rubber Goods

Under the classification of trade marks now existing in the United States Patent Office, if a rubber manufacturing company is desirous of protecting its entire line of goods by trade mark registration for a new or novel name or design, it is necessary to make twelve separate and distinct applications for trade mark registration in order to cover the entire field of rubber goods.

This does not appear to be true in other lines as, for instance, a glass manufacturer can make one application for a trade mark registration and so long as the article is made of glass he can put it on the market under his registered trade mark regardless of its quality, shape, or size, or any other distinctive feature, and still come within the requirements of the Patent Office.

The Rubber Association of America is making a laudable effort to obtain from the Commissioner of Patents a revision in the classification of the Patent Office whereby a complete line of rubber manufactures may be registered and protected by the filing of one application. A petition addressed to the Commissioner of Patents, explaining in detail the situation, is being circulated among rubber manufacturers by Harry S. Vorhis, secretary of the Rubber Association, who is acting under the instructions of the legislative committee of this organization.

Rubber manufacturers who wish to see modified the above-mentioned anomaly in trade mark classifications are requested to sign the petition and return it to the offices of the association, 17 Battery Place, New York. The formal protest, signed by all companies replying to the association's circular, will then be made to the Commissioner of Patents.

Annual Meeting and Banquet

The annual meeting of The Rubber Association of America, Inc., will be held at the Waldorf-Astoria Hotel, New York, Monday, Jan. 7, 1918, at 2.30 p. m. At this meeting directors for the ensuing year will be elected and reports of the officers submitted.

It is understood the board of directors will recommend that the constitution and by-laws of the association be amended so as to provide that the directors elected at the annual meeting be divided into three classes, to serve one, two, and three years respectively, and that thereafter all directors be elected for terms of three years.

Pursuant to the constitution and by-laws of the association, the committee on nominations will submit the following named members to serve as directors for the year 1918, to be voted upon at this meeting:

William E. Bruyn, L. Littlejohn & Co., crude rubber merchants, New York;

H. Stuart Hotchkiss, United States Rubber Co., System, New York;

William J. Kelly, Arnold & Zeiss, crude rubber merchants, New York;

Paul W. Litchfield, Goodyear Tire & Rubber Co., Akron, Ohio;

John S. Lowman, Philadelphia Rubber Works Co., Akron, Ohio;

Charles T. Wilson, Charles T. Wilson Co., Inc., crude rubber merchants, New York;

Charles A. Daniel, Quaker City Rubber Co., Philadelphia, Pa.;

John A. Lambert, Acme Rubber Manufacturing Co., Trenton, N. J.;

Harry T. Dunn, Fisk Rubber Co., Chicopee Falls, Mass.;

Charles J. Davol, Davol Rubber Co., Providence, R. I.;

Bertram G. Work, The B. F. Goodrich Co., Akron, Ohio;

A. D. Thornton, Canadian Consolidated Rubber Co., Ltd., Montreal, P. Q., Canada.

It will be noted from the above list that the committee has endeavored to secure representation from the different branchs of the rubber industry as well as from the various rubber manufacturing districts.

The annual meeting will be followed by the eighteenth annual banquet in the grand ballroom and Astor gallery of the Waldorf-Astoria at 6.30 o'clock. The banquet committee, composed of W. T. Cole, chairman, E. R. Henderson and Tracy S. Lewis, announces that at the speakers' table with Harvey S. Firestone, president of the association, will be Hon. Newton D. Baker, Secretary of War; Frank A. Vanderlip, president of the National City Bank, New York, and the Right Rev. Frank Du Moulin, Bishop of Ohio.

Heretofore, the annual banquet of the association has been purely a social affair. This year, the question of holding or abandoning it, on account of existing conditions, was a problem, but the board of directors and the banquet committee eventually concluded that the incentive and justification for all getting together in even larger numbers than before were even greater this year than ever.

The patriotic spirit will, no doubt, predominate on this occasion and the banquet committee announces its belief that rubber men will know better how to "do their bit" when they have listened to and taken back with them to the rubber plantation, the mill, the office, etc., the inspiring messages which are expected from speakers of such prominence and will be imbued with the American spirit to one hundred per cent of their human compound.

Rubber Men Assist Airplane Production

At a recent conference between men identified with the rubber industry and Howard E. Coffin, chairman of the Aircraft Board, the offer was made to coordinate all the big rubber plants of the country to facilitate the carrying out of the Government's air fleet program. At present, under the program that calls for 22,000 airplanes and the expenditure of $640,000,000, only about ten per cent of the available resources of the country are being utilized. Under full development of all resources, it is estimated that this country could produce with the very least effort 12,000 airplanes a month.

The committee of rubber men included Harvey S. Firestone, president of the Firestone Tire & Rubber Co.; Harry T. Dunn, president of the Fisk Rubber Co.; Paul W. Litchfield, vice-president of the Goodyear Rubber Co.; Charles B. Raymond, vice-president of the Goodrich Rubber Co.; George B. Hodgman, president of the Hodgman Rubber Co.; Charles T. Wilson, president of Charles T. Wilson Co., and Edgar B. Davis, director of the plantations of the United States Rubber Co. This committee was appointed by the Rubber Association of America as announced in the last issue of THE RUBBER AGE AND TIRE NEWS.

War Service Committee Appointed

In accordance with the vote of the board of directors of The Rubber Association of America, the executive committee has appointed a War Service Committee composed of the following named gentlemen: B. G. Work, chairman, The B. F. Goodrich Co., 1790 Broadway, New York; Paul W. Litchfield, Goodyear Tire & Rubber Co., Akron, Ohio; George B. Hodgman, Hodgman Rubber Co., Tuckahoe, N. Y.; J. Newton Gunn, United States Rubber Co., 1790 Broadway, New York, and Harvey S. Firestone, Firestone Tire & Rubber Co., Akron, Ohio.

This committee is to represent the rubber industry in its general relations with the Government. It will appoint subcommittees of not less than three, representing the various branches of the industry as these branches may be directly affected. The various divisions and firm members of the association will be asked to suggest representative members for these committees to Harry S. Vorhis, secretary.

The War Service Committee is similar to committees that have been appointed by other industries at the suggestion of the Chamber of Commerce of the United States of America.

With Men in the Trade

G. L. Sullivan on Red Cross Committee

George L. Sullivan, of the Fisk Rubber Co.'s advertising department, was recently appointed chairman of the Red Cross publicity committee for the present campaign in the district of Springfield, Mass. The responsibility of this appointment carries with it the making up of all newspaper advertising copy to be used in New England territory.

Scheible Represents Thermoid

C. E. Scheible has connected with the New York branch of the Thermoid Rubber Co. Previously he traveled the western part of New York state for the Fisk Rubber Co., but hereafter he will represent the Thermoid Co. in the same territory.

Republic Promotes White

W. P. White, manager of the Spokane branch of the Republic Rubber Co., was recently made general sales manager of mechanical goods of the Pacific Coast Division. Mr. White will make his headquarters in San Francisco.

Gentry with Thermoid

The Thermoid Rubber Co., Trenton, N. J., announces that H. C. Gentry is now connected with its sales department at Philadelphia, Pa. Mr. Gentry was formerly with the Acme Rubber Manufacturing Co. and Ajax Rubber Co. in the southern states.

Queripel Makes Change

W. H. Queripel is now a member of the staff of the Kelly-Springfield Tire Co., New York, and will represent the company in the Metropolitan district. Until German invasion stopped all Belgian industries, Mr. Queripel handled the Engelbert tire, made in Belgium, but since that time he has represented the Firestone Tire & Rubber Co. in New York.

Reilly Is Made District Manager

W. H. P. Reilly, of the Ajax Rubber Co., Trenton, N. J., has been appointed Pacific Coast sales manager with headquarters at San Francisco.

American Rubber Patents

ISSUED DECEMBER 4, 1917.

1,248,636—To James C. Eakens, Mingo Junction, Ohio, assignor of one-half to E. C. Brandfass, Steubenville, Ohio. Wheel ring and tire structure.

1,248,638—To Carleton Ellis, Montclair, N. J. Flame proof insulating composition.

1,248,681—To John C. Lauritzen, Akron, Ohio. Separable core for making pneumatic tire casings.

1,248,713—To Silas C. Pand, Chicago, Ill. Method of forming tire casings.

1,248,775—To Lorenzo D. Akers, Prairie View, Kans. Cushioning-wheel for vehicles.

1,248,863—To William Evans Hugh Humphrys, Hendon, England. Cushion tire. Process for vulcanizing rubber and products obtained thereby.

1,249,181—To Iwan Ostromislensky, Petrograd, Russia; assignor, by mesne assignments, to New York Belting and Packing Co. Process for vulcanizing rubber and products obtained thereby.

1,249,272—To Charles Reid Boggs, Arlington Heights, Mass., assignor to Simplex Wire & Cable Co., Boston, Mass. Process for vulcanizing rubber with selenium or its compounds.

1,249,273—To David E. Bohannon, San Francisco, Cal.; assignor, by mesne assignments, to Red Star Wheel Co., Seattle, Wash. Resilient wheel.

1,249,727—To Henry J. Doughty, Providence, R. I.; assignor to Doughty Tire Co., Providence, R. I. Tire.

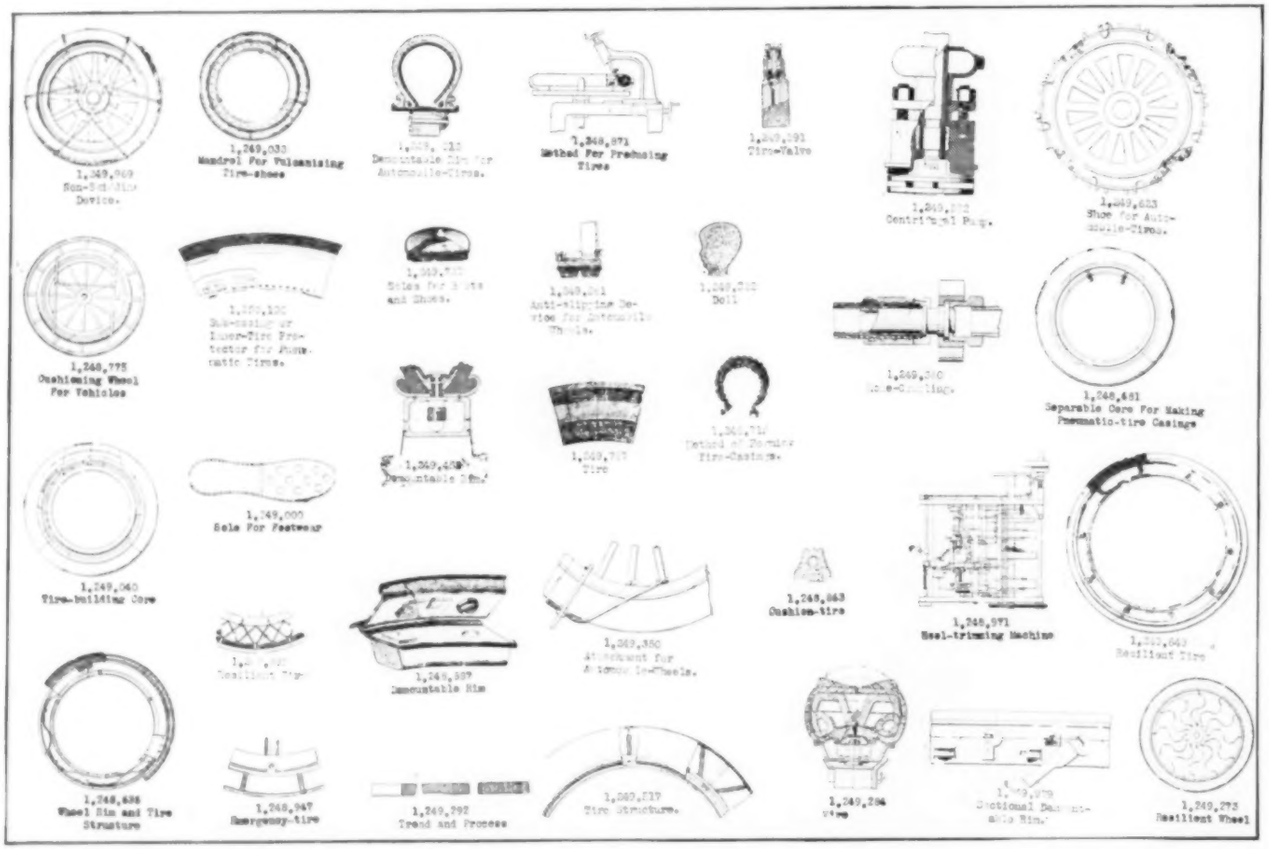
1,249,969—To John E. Kester, Curwensville, Pa. Non-skidding device.

1,249,979—To John Lawrence Maguire, Elkins, W. Va.; assignor of one-fourth to Silas B. Haffner, Elkins, W. Va. Sectional demountable rim.

1,250,100—To Jasper M. Davis, Denver, Colo. Sub-casing or inner-tire protector for pneumatic tires.

Recent Incorporations

Quick Rubber Co., Niles, Ohio; capital stock, $10,000; incorporator: C. Fillisu, Arden, Ohio.



1,248,871—To Franklin W. Kreamer, Carlstadt, N. J. Method for producing tires.

1,248,887—To Otis W. Mott, Jackson, Mich., assignor of one-half to Jackson Rim Co., Jackson, Mich., and one-half to Detroit Demountable Rim Co., Detroit, Mich. Demountable rim.

1,248,888—To Eduard Much, Ludwigshafen-on-the-Rhine, Germany, assignor to Badische Anilin & Soda Fabrik, Ludwigshafen-on-the-Rhine, Germany, a corporation. Treating products resembling caoutchouc

1,248,947—To Henry C. Struchen, St. Paul, Minn. Emergency tire.

1,248,971—To Erastus E. Winkley, Lynn, Mass., assignor to United Shoe Machinery Co., Paterson, N. J. Heel-trimming machine.

1,249,000—To Miriam E. Benjamin, Washington, D. C. Sole for footwear.

1,249,018—To Thomas Bryant, Santa Monica, Cal. Demountable rim for automobile tires.

1,249,030—To Frank A. Cigol, Little Falls, N. J. Method of forming articles of sheet rubber.

1,249,033—To Henry Z. Cobb, Winchester, Mass., assignor, by direct and mesne assignments, to United States Rubber Co., New Brunswick, N. J. Mandrel for vulcanizing tire shoes.

1,249,034—To Jefferson D. Crawford and Joseph Hughes, San Francisco, Cal.; assignors to Cactus Rubber Gum Co., Phoenix, Ariz. Ocotillo gum solution.

1,249,040—To Peter De Mattia and Barthold De Mattia, Clifton, N. J. Tire building core.

1,249,180—To Iwan Ostromislensky, Petrograd, Russia; assignor, by mesne assignments, to New York Belting and Packing Co.

1,249,284—To James Seadler, Sacramento, Cal. Tires.

1,249,292—To Leon F. Montgomery, Fort Recovery, Ohio; assignor of one-half to J. E. Grosjean, Lima, Ohio. Tread and process of making the same.

ISSUED DECEMBER 11, 1917.

1,249,322—To Edith Webster Calvert, Peoria, Ill. Doll.

1,249,350—To William E. Dilsaver, Supply, N. C. Attachment for automobile wheels.

1,249,380—To Howard W. Goodall, Aldan, and William S. Feeny, Philadelphia, Pa. Hose coupling.

1,249,452—To William J. P. More, New York, N. Y. Demountable rim.

1,249,517—To August Schreiber, Beloit, Kans. Tire structure.

1,249,561—To Charles Unmissig and William J. Miller, Pittsburgh, Pa. Anti-slipping device for automobile wheels.

1,249,572—To William W. Weitling, College Point, N. Y.; assignor to American Hard Rubber Co., New York, N. Y. Centrifugal pump.

1,249,591—To Oscar F. R. Bromberg, San Diego, Cal. Tire valve.

1,249,623—To James Henry Heffernan, Albany, N. Y. Shoe for automobile tires.

1,249,649—To Nelson W. McLeod, St. Louis, Mo. Resilient tire.

1,249,695—To Reinhart Victor Wagner, London, England; assignor to The Wagner Tyre Co., Ltd., London, England. Resilient tire.

1,249,702—To William B. Wiegand and Talmon Henry Risler, Montreal, Quebec, Canada; assignors to The Goodyear Metallic Rubber Shoe Co. Sole for boots and shoes.

Dayton International Sales Co.; capital stock, $10,000; incorporators: A. L. Smith and A. J. Vincent.

Akron Rubber Co., Akron, Ohio; capital stock, $25,000; directors: W. W. Christie, E. J. Christie and A. J. Christie.

Electric Rubber Reclaiming Co., Barberton, Ohio; certificate filed increasing capitalization from $200,000 to $400,000.

The Akron Rubber Co., Los Angeles, Cal.; capital stock, $25,000; incorporators: E. J. Christie and A. J. Christie.

Siegel-Rosenberg Metal & Rubber Co., Inc., Wilmington, Del.; capital stock, $1,000,000; to manufacture rubber heels and other rubber products.

Cementum Cloth Co., Watertown, Mass.; capital stock, $50,000; to manufacture rubber clothing; incorporators: Walter A. Guiel and Harry A. Guilfoyle, Providence, R. I. and Percy T. Sprague, Watertown.

Southern Rubber Co., Chattanooga, Tenn.; capital stock, $15,000; incorporators: H. A. Leonard, J. R. Scott, W. Davenport, J. Witherspoon and B. F. Amis.

Ocotillo Products Co., Indiana; capital stock, $3,000,000; to extract gum, rubber and other products; incorporators: Daniel M. Bechtel, Goshen, Ind.; James R. Fleming, Portland, Ind. and C. J. Murphy, Brookster, Ind.

Cambridge Smelting Co.; to deal in metals, minerals, rubber, etc.; capital stock, $50,000; incorporators: D. Finkelstein, J. Louis D. Covich, 44 Hewins Street, Boston, Mass. and James H. Jones.

Spadone Machine Co., New York; capital stock, $20,000; to make machinery for cutting textile fabrics; incorporators: H. Spadone, 126 Duane Street, New York, and W. W Spadone, 53 Franklin Avenue, Brooklyn, N. Y.

Market for Manufactured Rubber Goods

NEW YORK, Dec. 21, 1917.

Generally speaking the rubber industry throughout the country is very active and reports indicate that business is good except in certain districts where unfavorable weather conditions have been adversely affecting trade and the movement of raw materials and manufactured goods.

Rubber factories in the West have suffered some from shortage of coal, and it is becoming increasingly evident that the industry must expect a continued scarcity of fuel and more priority orders. The Interstate Commerce Commission appears to have come to the conclusion that these priority rulings are the only remedy for the transportation congestion. There have been some labor difficulties in rubber factories and more may be expected. Up to date, however, there have been no serious strikes.

Government orders and the good financial condition of the country make the situation of the rubber industry as a whole a strong one.

MECHANICAL GOODS

The market for mechanical rubber goods is quieter than it has been for some time and it will probably continue to be so until well after the holidays. This is normal for this season and this year many manufacturers welcome this breathing period in the sales end of their businesses. Deliveries are being greatly impeded by freight delays, while production is irregular and halting due to scarcity of labor and materials and to the steady pressure of Government orders.

TIRES

Like other branches of the rubber trade, the tire business is quiet. Salesmen are in for the holidays and are planning for an aggressive campaign for the next season. Retail sales have fallen off as is usually the case at this season.

As the war proceeds it seems more and more evident that the struggle will be prolonged and that the consumption of tires in this country the coming year will necessarily be less than last year.

It is reported that both wholesale and retail dealers have been backward in placing contracts for next season and that spring datings and the protection they offer against price increases have not met with usual success in inducing dealers to buy forward. The reason some dealers give for their hesitancy in buying is that last year they were induced to buy too heavily and were so long in disposing of their stocks that much of their profits were absorbed.

There may be some changes in price lists in January, but nothing definite can be reported at this date. It may be said, however, that the opinion current in the trade is that the increase, if it comes at all, will add only a small percentage to present prices.

SOLES AND HEELS

Like in all other lines of business at this season, the sole and heel trade is experiencing a period of quiet and there is little or nothing new to report. Large quantities of rubber and composition soles and heels are being absorbed by the shoe repair trade. One of the largest shoe repair men in New England is credited with the statement that at the present time practically 50 per cent of his customers demand fibre soles when they have their shoes repaired.

FOOTWEAR

The bad weather that has been prevailing throughout the Western and Eastern States has resulted in an unprecedented retail business in rubber footwear and it is said that the stocks of many retailers and jobbers are much lower than they usually are at this date.

The production of rubber footwear in 1917 was almost 50 per cent greater than during the previous year in spite of the fact that footwear factories have had much to suffer from scarcity of labor on account of various causes, but mainly enlistments, the draft and the high wages offered by munitions manufacturers. Footwear manufacturers maintained and increased their outputs by adopting more efficient methods and overtime work in their plants. Besides supplying the civilian requirements in this country and in some foreign lands, the American rubber footwear industry is said to have supplied several million pairs of rubber boots and arctics to the United States and the Allied Governments.

DRUGGISTS' SUNDRIES

The wholesale business in druggists' sundries is very quiet as it usually is at this season of the year. Many of the mills are busy executing orders in hand for regular trade and for the Government. They are also in the midst of the annual stocktaking. With the advent of the New Year there will probably be increased necessity of sidetracking civilian business in order to handle more Government work.

The Fabric Market

NEW YORK, December 21, 1917.

The Bureau of Census's estimate of 10,949,000 bales, exclusive of linters, was rather smaller than the general expectation created by the large ginnings for the period just preceding its publication, and a very sharp advance was the logical result. It would have gone further except for decided weakness in the stock market, caused by uneasiness as the war situation in Europe, and legislative developments on this side.

An early decline was followed by a sharp advance in the New York cotton market yesterday, with near months relatively stronger.

EGYPTIAN COTTON

The Egyptian Government has prohibited the export of cotton from Egypt except under license from the general officer in command. A Cotton Export Regulation Committee has been set up in Alexandria to allocate quantities to be exported to each country from Sept. 1 last. Licenses will be granted to each exporter on the basis of exports in recent years.

Reports from Alexandria under date of Nov. 9 state that the futures market there had suffered a severe setback after displaying much firmness. About 8,000 bales were to be shipped to America out of total engagements for prompt shipment to this country of about 25,000 bales. The spot market had been less active and values were generally easier, excepting good Sakelarides and Uppers, which were firmly held.

The crop estimates of the Egyptian Government and of the Alexandria General Product Association roughly placed the final outturn at about six and a quarter million cantars.

SEA ISLAND

The Sea Island cotton market continues to be very quiet, but as this is expected just before the holidays there seems to be no disposition on the part of holders to break prices. Small lots of Extra Fine and choice can be picked up at reasonable prices, but the better grades of cotton are held very firmly.

The U. S. Government's estimate of the Sea Island crop for the year was no surprise to the trade, as it has lately been expecting that the crop would run about 93,000 bales. The number of Sea Island bales is 77,638 for 1917, according to the Government estimate, against 102,496 bales for 1916, and 77,165 for 1915.

YARNS

The cotton yarn market is very firm and coarse numbers are being sought steadily by mills that have accepted Government orders for heavy duck. Much of the yarn needed for this work must come from spinning mills normally engaged upon other lines and naturally this makes the position of the spinners very strong.

The market generally speaking is quiet as is usual at this season.

FABRICS

Cotton mill men are being afforded a breathing spell and many of them say that they welcome it for the pace has been hard and the mill books are loaded with orders. Goods, however, are being moved irregularly and in some circles it is believed that buyers have ordered more goods than they can absorb.

The Navy Department is reported to be placing preemptory orders with mills for certain kinds of duck for which there is urgent need abroad, and the trade is becoming impressed with the constantly growing needs of the Government. Duck in many weights is not to be had readily for the civilian trade, and heavy duck cannot be had at all except by consent of the Priorities Board.

TIRE FABRICS

The tire fabric market continues very quiet with considerable variations in quotations. Most factories are able to deliver goods faster than the tire manufacturers care to take them and though the supply of tire fabric is sure to be smaller this year than it was last year no one fears that the tire industry will suffer greatly from lack of fabric. Certain high grade qualities of tire fabrics are sure to be short of the demand for the reason that suitable cotton will be lacking due to the apparent impossibility of getting sufficient Egyptian staple into this country and to the small crop of Sea Island cotton.

HOSE AND BELTING FABRICS

Mechanical duck cannot be had without priority certificates and even if this were not the case the mills would have little or nothing to offer owing to the heavy demand the Government is making upon their manufacturing facilities. This being the case the market for both hose and belting fabrics is high and very firm. At the present time 80 per cent of the poundage of the duck product is going to the Government and virtually no sales for duck are being made by large mills without consultation with Washington. This tendency is growing fast and will spread in a marked way in the first quarter of next year.

DRILLS, OSNABURGS AND SHEETINGS

The markets for these fabrics continue firm. Many sheetings of coarse constructions are said to be hard to get from the mills for prompt delivery. The volume of goods wanted by the Government and the Red Cross is increasing steadily and

this largely explains the difficulty of others to secure prompt deliveries from the mills.

GARMENT CLOTHS

Cloth markets are quieter without any special pressure to sell or buy. Concessions are reported as being made in some constructions. Generally speaking, however, sellers are not pushing their goods and buyers are listless about taking hold of any offerings at present reductions. Fine garment materials are being bought in moderate lots and slightly better prices are being offered for quick delivery.

BURLAPS

Burlaps are being offered in the market at concessions from the figures, which have been nominally held through the quiet period since the activity and sharp advance last November. Nevertheless the market continues quiet and buyers do not seem interested in this opportunity to buy lower than prices quoted lately.

NEW YORK QUOTATIONS

TIRE FABRICS.

17¼-ounce Sea Island, combed, sq. yd.	$1.62@1.73
17¼-ounce Egyptian, combed..	1.24@1.60
17¼-ounce Egyptian, carded.....	1.30@1.35
17¼-ounce Peelers, carded.....	0.75@1.13
17¼-ounce Peelers, combed.....	1.00@1.05
American Carded Staple, 12 to 20 yard, per lb. (pound basis)	.65
American Carded Staple, 8 to 10 yard, per lb. (pound basis)	.65

MECHANICAL DUCKS

Hose (nominal)	0.58@ .63
Belting (nominal)	0.57@ .63

DUCKS

Single Filling (pound basis).....lb.	.54..
Double Filling (pound basis).....	.60

DRILLS

37-inch 2.35-yard.....yd.	.24
37-inch 2.75-yard.....	.20
37-inch 3.00-yard.....	.18½
37-inch 3.25-yard.....	.17½
37-inch 3.50-yard.....	.16½
37-inch 3.95-yard.....	.14¾
38-inch 2-yard Southern.....lb.	.49
38-inch 2.00-yard Northern.....	.52
40-inch 2.47-yard Northern.....yd.	.21
40-inch 2.47-yard Northern.....	.25
52-inch 1.90-yard Southern.....	.27
52-inch 1.90-yard Northern.....	.28¼
52-inch 1.95-yard Southern.....	.26½
52-inch 1.95-yard Northern.....	.28
60-inch 1.52-yard Southern.....	.33
60-inch 1.52-yard Northern.....	.33

SHEETINGS

40-inch 2.35-yard.....yd.	.23
40-inch 2.50-yard.....	.22
40-inch 2-85-yard.....	.19
40-inch 3.00-yard.....	.16½
40-inch 3.25-yard.....	.17
40-inch 3.60-yard.....	.15
40-inch 3.75-yard.....	.15
40-inch 4.25-yard.....	.14½
38-inch Jacket Cloths.....yd.	.19-.21

TWILLS FOR PROOFING

37-inch 2.85-yard.....yd.	.19½
37-inch 2.35-yard.....	.24
37-inch 2-10-yard.....	.27

COTTON STOCKINETTES (52-inch.)

E—11½-ounce .....yd.	.75
A—11 -ounce	.50

BURLAPS

(Spot Carload lots.)

40-inch 8 -ounce.....	$17.00
40-inch 10 -ounce.....	21.50
40-inch 10½-ounce.....	22.00

Chemicals and Compounding Materials

NEW YORK, Dec. 20, 1917.

Deliveries on old contracts are quite heavy, and while new business is not coming forward so freely, owing to the holiday season, etc., a healthy undertone is in evidence. The freight situation is causing much inconvenience, and in some instances this has actually influenced market quotations, especially for spot material. The position of the market for sulphur is strong, but refiners have announced no price changes. Aniline oil has been lowered in some quarters, due mainly to competition. Benzol prices have been subjected to a general downward revision, but as a good business has been done at the lower prices the market is now on a firmer basis. There is a quiet market for lead pigments. Zinc oxide for shipment over the first quarter of 1918 has met with a good demand on the new basis of 10¼c. per pound for the Horsehead and XX brands. Caustic soda has been lowered again. Antimony sulphurets are steady under moderate offerings for immediate shipment. English vermilion is irregular.

ANTIMONY SULPHURETS

The market for standard brands of antimony sulphurets is holding firm, but no price changes have been announced. Deliveries on contract are absorbing supplies. Some handlers report that they are sold up well into 1918. Nominal quotations are repeated on the basis of 25 @ 26c. per pound for the red, 28 @ 30c. for the golden, and 45 to 50c. for the crimson.

ANILINE OIL

Demand is quiet and a little selling pressure has been noted. While leading producers are asking from 26 to 27c. per pound, drums extra, second-hands reported sales of limited quantities at prices ranging from 25 to 25½c. per pound.

BENZOL

Selling pressure brought out lower prices. Leading producers lowered the market for pure benzol to the basis of 40 @ 45c. per gallon, in tanks, immediate shipment. Contracts have been closed for pure benzol for shipment over the first half of 1918 as low as 35c. per gallon, in tanks, f o b works. A good volume of business has been placed at the lower figures and towards the close the market presented a firmer undertone.

CAUSTIC SODA

No improvement in the demand is reported and prices again eased off, closing at 7⅛ @ 7¾c. per pound. Second-hands offer 1918 deliveries at 6½ @ 6¾c. per pound.

COLORS

Some irregularity in spot prices for English vermilion has been reported. There are sellers at prices ranging from $1.75 to $1.95 per pound. The advance in quicksilver, however, brought out a firmer feeling towards the close. Rubber makers' blacks are offered freely at 4½ @ 6c. per pound. Ultramarine blues are held at 17 to 35c. per pound, depending upon quality.

LEAD PIGMENTS

The market was quiet, but corroders maintained prices on the basis of 8½c. per pound for the sublimed, and 9c. for the basic carbonate, round-lots. Litharge closed unchanged at 9½ @ 10c. per pound. Orange mineral also was unchanged.

SULPHUR

Owing to the freight situation the market for sulphur was in a more or less nominal position. Refiners report that shipments of crude material are coming forward slowly. Quotations for refined sulphur were nominally unchanged on the basis of $3.85 per 100 lbs., in barrels, car-lots.

ZINC OXIDE

A good volume of business has been placed in XX and Horsehead brands for shipment over the first quarter of 1918 on the basis of 10¼ @ 10½c. per pound, the inside figure obtaining for 50-ton lots.

Prices Current for Chemicals, Fillers, Colors, etc.

Acetone	lb.	*.35 @	.37
Acids, Acetic, 28%	lb.	.05¾ @	.06¼
Carbolic, C. P.	lb.	.54 @	.55
Cresylic, 95%	gal.	1.10 @	1.15
Muriatic, 20 deg.	lb.	.02 @	.02¼
Muriatic, 22 deg.	lb.	.02½ @	.02⅝
Nitric, 40 deg.	lb.	.08½ @	.08¾
Nitric 42 deg.	lb.	.09¼ @	.09½
Sulphuric, 60 deg.	lb.	.01¾ @	.02
Tartaric, crystals.	lb.	.78½ @	—
Aluminum Flake	ton	22.00 @	24.00
Aniline oil	lb.	.25 @	.27
Antimony, metal, spot	lb.	15.00 @	15.25
Oxide	lb.	16.00 @	17.00
Sulphuret, red	lb.	.25 @	.26
Sulphuret, golden	lb.	.28 @	.30
Sulphuret, crimson	lb.	.45 @	.48
Asbestos	ton	40.00 @	60.00
Asphaltum, Egyptian	lb.	.22 @	.28
Domestic	ton	18.00 @	25.00
Barium sulphate, technical	lb.	.04¼ @	.04¾
Chloride	lb.	.04 @	.05
Barytes, prime white imported	ton	38.00 @	40.00
white, domestic	ton	28.00 @	32.00
off color, domestic	ton	18.00 @	22.00
Benzol, pure	gal.	.40 @	.45
Beta-naphthal, sublimed	lb.	.85 @	.90
unsublimed	lb.	.65 @	.70
Blacks, Drop	lb.	.08 @	.15
Ivory	lb.	.16 @	.30
Carbon gas	lb.	.22 @	.30
Lampblack R. M.	lb.	.04½ @	.06
Mineral blacks	ton	24.00 @	28.00
Blues, Prussian	lb.	.65 @	1.35
Soluble (potash)	lb.	1.45 @	1.75
Ultramarine	lb.	.18 @	.35
Browns, Umber, Turkey, burnt, powdered	lb.	.04 @	.05
American, burnt.	lb.	.03 @	.03½
Cadmium sulphide, yellow	lb.	2.25 @	2.50
Carbon, bisulphide, bulk	lb.	.07¼ @	.07¾
tetrachloride, drums.	lb.	.16 @	.16½
Caustic Soda, 76@78%	lb.	.07 @	.07¼
Chalk, precipitated, extra light	lb.	.05 @	.05¾
light	lb.	.04¾ @	.05¼
heavy	lb.	.03¾ @	.04¼
China clay, domestic	ton	18.00 @	22.00
imported	ton	25.00 @	35.00
Fossil flour	lb.	.06 @	.10
Gilsonite	ton	40.00 @	44.00
Glue, extra white	lb.	*.28 @	.38
medium	lb.	*.25 @	.28
low grade		*.22 @	.25
Glycerine, C. P. (drums)	lb.	.68 @	.69
Graphite, flake (bbl.)	lb.	.15 @	.20
powdered (bbl.)	lb.	.10 @	—
Green, chrome, R. M.	lb.	.12 @	.20
Ground glass (fine)	lb.	.03 @	—
Hexamethylene	lb.	.90 @	.95
Infusorial earth, powd'd.	ton	60.00 @	—
bolted	ton	70.00 @	—
Iron oxide, red, reduced grades	lb.	.04 @	.05
red, pure, bright	lb.	.12 @	.14
Lead, red oxide of	lb.	.10 @	.10½
sublimed blue	lb.	.08½ @	.09
white, basic carb.	lb.	.09 @	.09½
white basic sulph.	lb.	.08½ @	.09
Lime flour	lb.	.01½ @	.01¾
Litharge	lb.	.09½ @	.10
English	lb.	*.12 @	.13
sublimed	lb.	.09¼ @	.09¾
Lithopone, domestic	lb.	.06½ @	.07
Magnesia, carbonate	lb.	.12 @	.14
calcined, heavy	lb.	.12 @	—
Calcined, light	lb.	.70 @	—
Magnesite, calcined, pwd.	ton	65.00 @	70.00
Mica, powdered	lb.	.03¾ @	.05
Mineral rubber (asphaltum base)	ton	40.00 @	60.00
Naphtha, motor gasoline, (steel bbls.)	gal.	.24 @	—
68 @ 70 degrees (steel bbls.)	gal.	.30 @	—
70 @ 72 degrees (steel bbls.)	gal.	.31 @	—
73 @ 76 degrees (steel bbls.)	gal.	.33 @	—
machine (wood bbls.)	gal.	.41 @	—
Oil corn, crude	cwt.	*19.00 @	—
corn, refined	cwt.	*20.61 @	—
linseed (bbl.)	gal.	1.25 @	1.26
palm, Lagos	lb.	*.30 @	.32
pine, yellow	gal.	.44 @	.45
rapeseed, refined	gal.	1.65 @	1.70
rapeseed, blown	gal.	1.70 @	1.75
rosin, first rectified.	gal.	.42 @	.43
tar (commercial)	gal.	.30 @	.32
Orange mineral, American.	lb.	.13 @	.13½
imported	lb.	*.15 @	.20
Petrolatum, bbls., amber.	lb.	.05 @	.05¼
pale yellow	lb.	.05¼ @	.05½
Pipe, tar, retort	bbl.	14.50 @	14.60
Pitch	bbl.	4.50 @	5.00
Plaster of paris	bbl.	2.00 @	2.50
Red, Tuscan	lb.	.22 @	.30
Indian (reduced)	lb.	.06 @	.08
Standard	lb.	.08 @	.11

Rosin (common to good), @ 280 lbs.	bbl.	6.65 @	6.90
Rotten stone, powdered	lb.	.02¾ @	.04¼
Rubber substitute, Black	lb.	.11 @	.15
white	lb.	.14 @	.16
brown	lb.	.16 @	.17
Shellac, fine orange	lb.	.66 @	—
T. N.	lb.	.59 @	.60
Bleached, ordinary	lb.	.56 @	—
Bleached, bone dry	lb.	.66 @	.67
Silex (silica)	ton	24.00 @	34.00
Soapstone, powdered	ton	12.00 @	20.00
Starch, corn, powdered	lb.	.05¾ @	.06½
Sulphur, crude	ton	*50.00 @	..
refined, flour, per 100-pounds, in bbls.		3.85 @	4.40
roll		3.70 @	4.15
commercial		3.35 @	3.65
Talc, American	ton	12.00 @	16.00
French	ton	22.00 @	30.00
Toluol, pure, in drums	gal.	*2.50 @	3.00
Tripolite earth	ton	60.00 @	65.00
Turpentine, pure gum—			
spirits	gal.	.46½ @	.47
wood	gal.	.41½ @	.42½
Venice, artificial	gal.	.12 @	.13
Vermilion, English	lb.	1.75 @	1.95
Wax, beeswax, crude yel.	lb.	.35 @	.37
ceresin, white	lb.	.18 @	.19
carnauba, No. 3	lb.	.48 @	.49
Wax, Montan	lb.	*.35 @	.40
Wax, ozokerite, black	lb.	.75 @	.80
ozokerite, green	lb.	*.85 @	.95
Paraffin, refined, 118/120 M.P. (bbls.)	lb.	.10½ @	.11
123/125 M.P.	lb.	.11⅜ @	.11⅝
128/130 M.P.	lb.	.11⅝ @	.11¾
133/136 M.P.	lb.	.12¾ @	.13
Crude, 117/118 M.P.	lb.	.08¼ @	.08½
124/126 M.P.	lb.	.08½ @	.08⅝
Whiting, commercial	cwt.	.95 @	1.10
Alba	cwt.	1.00 @	—
Paris, white, American	cwt.	1.25 @	—
English cliffstone	cwt.	1.50 @	—
Yellow chrome	lb.	.22 @	.28
Zinc oxide, American process, horsehead brand	lb.	†.10¼ @	.10½
selected	lb.	†.10¾ @	.11
"XX red"	lb.	†.10¼ @	.10½
French process, green seal	lb.	†.13½ @	.13¾
red seal	lb.	†.13 @	.13¼
white seal	lb.	†.14 @	.14¼
Zinc substitutes	ton	30.00 @	35.00
Zinc, sulphide, pure	lb.	*.07½ @	.08

†Contract prices. *Nominal.

The Crude Rubber Market

NEW YORK, Dec. 21, 1917.

Interest centered in the sharp upturn in prices for Brazilian rubber. During the last fortnight the market for Para up-river fine advanced to the extent of 8 cents a pound, while the medium grades show net gains of 4 and 5 cents. The strength in Para rubber brought out a firmer feeling in plantation grades, which advanced from 1 to 1½ cents a pound. A fair volume of business was reported, and while manufacturers took hold more freely, most of the buying was inspired by the fact that December contracts are maturing and speculators were forced to take to cover.

The advance in Brazilian grades followed upon receipt of advices from the South American republic to the effect that the Government was considering to support the market by limiting exports. This led to increased activity and it was rumored that certain large consumers here were quietly absorbing supplies. Efforts to support the market have been tried before by the Brazilian authorities and it is pointed out by members of the trade that all previous moves to sustain prices came to naught.

Total production of rubber in Brazil comprises less than one-fifth of the world's production and this is regarded as the reason for the general slump in the market for wild rubber. According to latest official returns the imports of India rubber into the United States for the nine months ending with September amounted to 313,948,536 lbs., valued at $174,137,968, which compares with 202,944,932 lbs., valued at $119,763,425 for the corresponding period a year ago.

In London prices moved within narrow limits. A fortnight ago first latex pale crepe stood at 29¾*d.* a pound. The market then eased off, selling down to 28½*d.*, but on increased activity prices recovered, closing at 29¼*d.* A feature was the strength in ribbed smoked sheets, which closed on a parity with first latex.

First latex pale crepe met with a good inquiry from manufacturers for shipment over 1918. The market closed firm at 55c. spot, 55c. for January-June and 54½c. a pound for July-December. Smoked sheets, ribbed, advanced from 52½c. to 54½c. a pound, spot and January-June shipment, closing within ½c. of the price named on first latex.

Para up-river fine sold at 53 and 53½c. early during the interval, but today sellers were asking from 61 to 62c. a pound. Coarse settled at 41c., with Caucho ball at 40c. Centrals also were advanced, in sympathy with medium grades of Para rubber. Corinto closed firm at 38c., with Esmeralda at 37c. Guayule rubber advanced to the extent of 2c. a pound, closing at 28c. nominal.

	Spot.	Jan.-June.	July-Dec.
Para—Up-river fine lb.	61	64	..
Up-river medium	53	53	..
Up-river coarse	41	..	..
Caucho ball	40	..	..
Islands fine	50	..	..
Island's coarse	27	..	..
Cameta	27	..	..
Madeira fine	62	..	..
Ceylons-Smoked sheets, ribbed	54	54	53½
Smokers sheets, plain	53	53	52½
First latex pale crepe	55	55	54½
Amber crepe	52	52	51½
Clean brown crepe	49	48	48
Centrals—Corinto, prime	38	..	..
Esmeralda, prime	37	..	..
Mexican scrap	35	..	..
Balata, sheets	82	..	..
Balata, block Panama	56	..	..
Guayule	28	..	..
Africans—Rio Nunez, string	*62	..	..
Massai, red	*48	..	..
East Indian Pontianak	12	12	..
Palembang	12¼	12¼	..

* Nominal.

Scrap Rubber

NEW YORK, Dec. 21, 1917.

Very little interest appears to be shown in offerings by rubber reclaimers and the market for scrap rubber has an easy undertone. Prices are nominal.

The following prices were paid for scrap rubber delivered at the reclaiming mill:

Boots and shoes	9 @	9¼
Arctics, trimmed	.. @	7
Arctics, untrimmed	.. @	6
Tires—Automobile	5½ @	5¾
Bicycles, pneumatic	4½ @	4¾
Mixed hose	2¼ @	2½
Air brake	.. @	5¾
Inner tubes, No. 1	21 @	..
Inner tubes, No. 2	10½ @	11
Red	10½ @	11

Italy Fixes Sulphur Prices

The Italian Government has issued a decree regulating the prices and conditions of sale for raw sulphur in Sicily.

The maximum prices in lire of $0.193 for worked sulphur in Sicily are: Refined, in bricks, 46.03 lire per quintal of 220.46 lb.; refined in cylinders, 46.53 lire (exclusive of packing); sublimated, 53.33 lire (jute sacks of 50 kilos, or 110 lb.); raw ground, 45.73 lire; refined ground—60 to 65 per cent of fineness, 51.13 lire; 65 to 70 per cent, 51.63 lire; 70 to 75 per cent, 52.33 lire; sifted—75 to 80 per cent, 53.13 lire (cotton sacks of fifty kilos); 80 to 85 per cent, 54.03 lire; 85 to 90 per cent, 55.03 lire.

The prices for worked sulphur apply to Catania, Licata, Porto Empedocle and Termini Imerese, f.o.b. For sales in the other localities of Sicily the prices for worked sulphur must be augmented by the cost of transport, as shown by invoice, and by the loss by diminution, which can not, however, exceed one per cent and is applicable only to refined sulphur in bricks.

Sale Prices on the Continent and in Other Islands

The prices for raw sulphur on the Continent and in other islands are those given in the list of the Sicilian Sulphur Association, augmented by the cost of transportation from the various markets of the island to the place of destination, as shown by the invoice or established by calculation (based on the cheapest means of transport and route practicable), as well as the loss by dimiuution, not to exceed two per cent.

The prices of worked sulphur are those already indicated, augmented by the costs of transport and by the loss by diminution, which can not exceed one per cent and is applicably solely to refined sulphur in bricks.

The price of sulphur mineral ground, produced in the Province of Avellino, containing at least 25 per cent of sulphur, is fixed at 10.50 lire the quintal f.o.b. at station of Tufo or of Altavilla Irpina, in sacks of fifty kilos each. The sale price in the other localities will be augmented by the costs of transport to the place of destination.

For the resale of worked sulphur or of sulphur mineral ground, there is allowed a margin of profit to the reseller not exceeding two per cent on the prices already indicated for lots of ten quintals (2,204.6 lb.) or more, and a margin of profit not exceeding four per cent for lots below ten quintals.

News of the Dealers

City Auto Tire & Supply Co., East Twenty-fourth street and Chester avenue, Cleveland, Ohio, has established a service station for Hayes wire wheels.

Bargain Tire House, 109 Michigan street, N. W., Grand Rapids, Mich., has been established with William J. Large as general manager. Several carloads of tires have already been placed on display.

J. T. Moody, Texarkana, Ark., has organized the Central Tire & Repair Co., and will have salesrooms and a vulcanizing plant at 308 State Line avenue.

The St. Aubin Tire Repair Co., 1016 St. Aubin Street, Detroit, Mich., has recently opened for business.

E. H. Wilcox & Son, Lansing, Mich., have purchased the Tracy Auto Tire Repair Co., at 318 East Michigan Avenue, and the business name has been changed to the Auto Tire Repair Co.

Kelly-Springfield Tire Co., Aberdeen, S. D., managed by M. H. Bantz, has opened salesrooms at 516 South Main street, where it will carry a stock of tires and accessories.

The Pacific Sales Co., Tacoma, Wash., of which Don C. Modrai is manager, has been appointed representative for Vacuum Cup tires. The company handles a large supply of accessories.

TIRE NEWS

Tire Adjustments*

By F. R. Goodell

Converse Rubber Shoe Company, Malden, Mass.

Tire adjustments is a topic around which is clustered a considerable amount of camouflage. It is a first-class conundrum to the average dealer and a bugaboo which discourages many from entering the field.

I have in mind a dealer in New England who had successfully resisted the temptation to include tires with his otherwise complete line of accessories. In this instance, sales probabilities, profits and turnover were conceded to be satisfactory, and it was only after a lot of sounding that that gentleman stated his case; it took the form of a story. It seemed that Little Johnny had a cold and his teacher had found it necessary to jack him up repeatedly about blowing his nose. Finally he blurted out, "I've blowed and blowed, but she won't stay blowed."

The contention was, of course, that tires can be sold and sold, but they won't stay sold. He went on to point out that there was something very comforting and final about selling a saw or chisel that he couldn't expect from a tire.

Mastering the Angles

This pessimistic viewpoint is tinctured with just enough truth to constitute a serious barrier in interesting the more conservative hardware dealers that it is not wholly in line with the facts as evidenced by the thousands of dealers who have reduced tire merchandising to a permanent and profitable science. After all, tires are just merchandise and are subject to much the same rules that govern all commercial transactions. At the same time there are certain conditions, which are essentially peculiar to the tire business, and the difference between success or failure lies in thoroughly mastering every slant, slope, and angle of the enterprise.

Permanent success in any field must be based on satisfaction. Good will itself is nothing but capitalized satisfaction, and the merchant who finds out how to render it on tires has the whole situation in the hollow of his hand. The adjustment feature, on the very face of it, is an attempt to render belated monetary satisfaction in lieu of the more substantial satisfaction to be expected from the merchandise itself. The word "expected" goes to the heart of the matter, for any man is satisfied when he gets as much, or more than he expected. If his expectations are inordinate or based on impossibilities, the edifice of goodwill is shaken. I think it can be taken for granted that for competitive reasons alone, if for no other, manufacturers are building every atom of value into their product that the selling price will permit; if then there is something rotten in Denmark it lies in the way the article is jointly merchandised by maker, jobber and dealer.

Safe and Sane Handling

One of the factors which sets tires apart from the general run of merchandise is the fact that the conditions under which a tire delivers its value are not only exacting, but very obscure. A tire goes into action "under blanket"; it is hidden from the driver's observation when in motion so that he cannot see for himself some of the utterly needless handicaps which often beset it. Take the instance of the chisel. My friend the dealer sells it to a man who carelessly shatters its edge against a nail. The article is seriously damaged, but the owner enters no indictment against the merchandise because he is aware that his own abuse is wholly responsible. Here is a case where cause and effect are both obvious, but with tires it is often different since only the effect is discerned in many instances.

A safe and sane driver brings in a tire worn down to the fabric after a few hundred miles. He is bitterly disappointed and expects to be reimbursed in full for the difference between the maker's warrant and the actual mileage. He states that the tire has been kept inflated to the recommended pressure, and that it has never left the wheel. The tire comes before the adjuster and he sees in a second that one of the major crimes against tire mileage has been committed against it. It has been applied to a wheel badly out of alignment—a condition which will sometimes run a tire out in fifty miles. The owner, however, is not in a reasonable state of mind; he is inclined to accuse someone of putting the lie in alibi—and satisfaction "flies the coop," unless the loss is voluntarily accepted by the dealer, jobber or maker. This is actually what is done in many cases and is called "policy adjustment," the loss being added to cost of doing business and charged off pro rata in higher prices to the just and unjust alike. The owner in this case is strengthened in his belief that only his insistence got him a square deal, and so he goes right on abusing his tires. He has got less than he expected, but has obtained an indemnity which keeps his expectations just where they were.

The Maker's Guarantee

One of the big outstanding reasons for the unqualified expectations of most owners is the maker's guarantee. It has been found necessary to have some gage with which to measure the value of a tire—a sort of yardstick which will stand for value, and by which any deviations from that value can be reckoned and reimbursed. The statement that the guarantee is based on so many thousand miles under normal conditions is taken quite literally to mean that there is a definite and unqualified mileage guarantee. As a matter of fact, there is no such intention, and it would be as absurd to expect it as it would be to look for a definite guarantee of mileage with each gallon of gasoline. Another handicap to satisfaction is the fact that the sell-

*Address delivered at convention of American Hardware Manufacturers' Association and the National Hardware Association.

ing end of the business is apt to take very little pains to alter this unfounded expectation of value, and this is in a way aggravated by constant advertising if abnormal mileage results under the most favorable conditions.

Hardware Dealer Wholesome Factor

The remedy will have to come from the distributing end of the business, and the manufacturer looks forward with hope to the advent of more favorable conditions now that the hardware dealer is becoming a wholesome factor. It is expected that he will square this new enterprise with the sane and dignified methods which have made the hardware trade a cornerstone of American enterprise. The best leverage for action is afforded by educational work of an intensive nature. The conditions which make it impossible for a tire to render satisfaction should be studied and standardized. The dealer, and through him the owner should be thoroughly enlightened and his expectations tempered with facts as they are. You can not do much with a man who is as mad as a house afire, but a lot can be done to prevent the blaze from starting.

In passing, mention might be in order of those major misdemeanors which will cut down any tire in the prime of its life. They are:

Underinflation, Neglected Cuts.

Underinflation, Faulty Wheel Alignment.

Underinflation, Unequal Brake Tension.

Underinflation, Rut and Cartrack Driving.

Underinflation

Underinflation, as you see, goes double as it is directly or indirectly the cause of over half the ills that tires are heir to. Each of these crimes has a wide-open clue that would be apparent even to a Scotland Yard detective. There are other abuses that are more obscure, but a splendid start will be made if concerted action is taken with regard to the few mentioned.

From a selfish standpoint alone, the jobbers can do much to make their experience with tires permanently profitable by standardizing the condition surrounding the sale and adjustment of the product. Aside from that a great and unselfish national good can be accomplished.

An Awful Waste

The amount of waste that can be conserved by concerted action is immense. I quote from the *Los Angeles Express* of April 28. The article gives a fair and unbiased word picture of conditions as they actually exist:

"Enormous tire waste in last year, 1916; the motorists of the United States took from their wheels and replaced some 9,000,000 tires, which had apparently run their course, representing an original expenditure of about $300,000,000. The cry of the car owners who discarded this great multitude of tires is for better tires, less tire troubles, fewer tire changes, longer tire life, lower cost per mile. Yet through the application of the simplest methods of tire conservation at the command of every motorist, it is estimated that fully one-half of this enormous mortality of tires and loss in money might have been prevented. Thousands of these tires were replaced because they had passed away before their time.

"If $150,000,000 of the nation's tire bill could be saved annually, five magnificent highways could be built across the continent each year, and the nation so honeycombed with motor roads as to put every nook and corner of it in direct touch with the big centers of population. Another Panama could be built in three years, the national debt lifted in seven years, or a fleet of ten first-class battleships built for our Navy each year. The conservation even of half this waste would be a splendid national economy, and along with it would come a general bettering of conditions under which the tire business is carried on. It is surely up to every man connected with the enterprise to do his part in bringing home these facts to the tire user, and from a purely selfish standpoint alone it will pay big dividends."

One hundred and fifty millions of dollars is a pretty snug sum, and there is no question about the necessity of some intense "Hooverizing" in cutting this waste down to a more nominal figure. I doubt if there is any other business today which will show a wastage of fifty cents on the dollar.

Those of us who manufacture are making tires the best we know how. All of us are leaning backward in an attempt to be upright; in fact, we are getting a little sway backed in trying to put the just in adjustments.

I am sure that any action that the National Hardware Association can exert in standardizing the conditions under which sales and adjustments are handled will be a patriotic thing under present conditions, and profoundly appreciated by maker, dealer and consumer.

Demand for Factory Brand Bicycle Tires

Two years ago Seneca G. Lewis, general manager of the Pennsylvania Rubber Co. of Jeannette, Pa., predicted a big revival in popularity of the factory brand of bicycle tire. He pointed out that the then prevailing plan of marketing mediocre tires under so-called special brands was unfair to the user and had been so abused that the practice soon would come to grief. Since then the phenomenal comeback of the bicycle during the past two seasons, with an attendant demand for factory brand tires, has proved the validity of Mr. Lewis's stand.

"The practice," says Mr. Lewis, "harks back to the boom period of 1893 to 1900, when the specially branded tire was practically an unknown quantity. It was unfortunate for the industry, however, that in the rush to meet the demand for these advertised tires of known quality, an adequate selling plan had not been devised. A schedule of fixed prices to the dealer and advertised prices to the consumer was not maintained. Price cutting was unwittingly fostered by permitting several dealers in the same city to handle identical makes.

"This slashing of prices likewise became a favorite pastime for the jobbers. The same factory brand tire was exploited in the same territory by a dozen or more jobbing concerns, and the consequence was a maximum profit averaging 10 per cent for the jobber. Naturally the jobber was forced to seek relief, and in casting about for a remedy the specially branded tire came into vogue.

"Increased manufacturing facilities by this time had made it possible for the makers to meet the heavy consumer demand and stimulate a surplus output. Jobbers therefore were enabled to have tires built to their own specifications under their individual names or brands.

"This being accomplished, the trade was called upon at very frequent intervals and it wasn't long before the jobbers' special brands cut deep inroads into the market. The jobber became a powerful factor. He allowed a liberal guarantee in his selling price to the dealer and exacted from the manufacturer proportionate liberality. The volume of business he controlled was of sufficient magnitude to enable him, through heavy competition, to practically dictate contracts to the manufacturers.

"Under these conditions, it was possible for him to increase his percentage of profit from year to year. But the manufacturer, under the

goad of close margins resulting from the keenest possible competitive bidding, finally succumbed to the inevitable and curtailed quality without a corresponding reduction in consumer prices.

"Then it was that the consumer awakened to the fact that he was not getting what he paid for. Service dropped way below par. The specially branded tire failed to bring proper adjustments without long delays. The demand became daily more insistent for bicycle tires of known quality backed by the manufacturer's own guarantee.

"Although reasonable price is essentially important, it is not the only consideration. The comfort and ease attendant upon the use of a good bicycle tire are responsible for increased interest in the bicycle as a means of healthful recreation, pleasure, and business. It is safe to predict that during the coming season the thinking and discriminating bicycle user, who has been influenced in buying a bicycle by the high standing of the nameplate it bears, will not buy tires for his reputable mount that are not dignified and vouched for by the name of the factory that makes them.

"Although the profits of the jobbers who in the past tenaciously clung and still cling to the special brand of tire will be materially affected through a lessened demand and necessity for greater conservation in computing their profits on specially branded tires, the interest of those few is of so little importance as compared with the general welfare of the bicycle industry that the homecoming of the reputable factory brand of bicycle tire to its leading position in the bicycle tire market cannot be heralded otherwise than as an event marking an epoch of much needed reform in the bicycle tire world and with the revival of the bicycle this is not improbable."

Ramifications of the Automobile Industry

Recent statistics showing the enormous growth and ramifications of the automobile industry have been compiled by the National Automobile Chamber of Commerce and announced through its general manager, Alfred Reeves. Those figures are impressive. For instance, Mr. Reeves states that the 550 manufacturers of passenger and commercial cars in thirty-two states of the Union have an invested capital of $736,000,000, employ 280,000 workers and pay $275,000,000 annually in wages and salaries. During the fiscal year ended June 30, 1917, they produced 1,806,194 motor vehicles of a gross wholesale value of $917,470,938. Exports of motor vehicles alone during that period amounted to $90,000,000.

Raw materials for the production of fabricated and partly manufactured materials, automobile parts and accessories, are drawn from other industries in all parts of the country, $3,000,000 worth being used yearly. The automobiles and truck manufacturers draw these materials for the construction of complete motor vehicles from the parts and accessory makers and also directly from the manufacturers of many raw and partly fabricated materials. In the twelve months ended last June they paid $480,000,000 for this purpose.

There are 1080 parts and accessory makers, having an invested capital of $336,000,000. They employ 320,000 workers and pay $288,000,000 in wages annually. Tire makers alone produced 18,000,000 tires during the fiscal year ended June 30, 1917, valued at $450,000,000. Nearly half of these were bought by car manufacturers to equip new cars produced during the year.

Manufactured automobiles and trucks are sold by the factories to distributors and dealers and direct to users. Subdealers buy from distributors or wholesalers and most of the users buy from dealers and sub-dealers. There are 2,800 distributors with $41,000,000 invested capital and 28,000 employes, to whom $25,200,000 is paid in wages annually.

Retail dealers scattered throughout every city and village in America number 25,000. Their invested capital amounts to $184,000,000 and they employ 202,000 salesmen, repairmen and other help, to whom $159,000,000 are paid yearly.

Most of the garages and repair shops are owned and operated by dealers and distributors and the statistics for them are included under dealers, although there are many independent garages and repair shops that are not connected with car agencies.

On July 1, 1917, there were 4,242,800 registered automobile owners in the United States. About 400,000 of the registered vehicles were commercial cars. After purchasing their cars from the dealers or from manufacturers direct, these owners store their cars in public garages, have repairs made in the repair shops, buy tires, supplemental equipment, automobile clothing, etc., from the 2,550 supply houses, which draw their stocks from the accessory makers, and purchase large quantities of gasoline from innumerable gasoline stations, which in turn secure their gasoline direct from the oil companies.

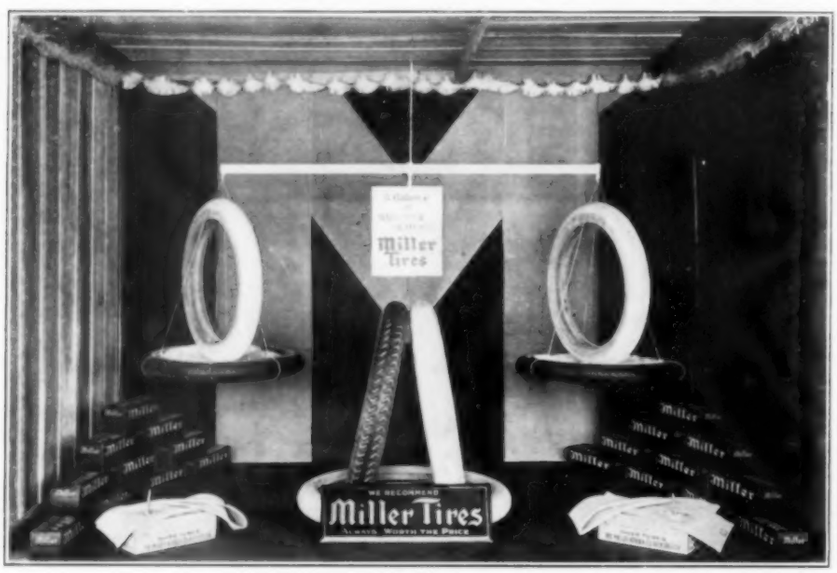
The automobile industry is an interdependent business and it helps support dozens of other important industries, and is the sole dependence of 27,800 distributors and dealers, and provides a livelihood for nearly 1,000,000 employees with their families.

With thousands of parts entering into the construction of each motor car, the inability of the manufacturers to get any essential part will delay production and may even stop it entirely. A serious delay or reduction of production in the late winter is almost sure to turn a season that ordinarily would have been profitable for the distributor and dealers into one of financial loss and even failure.

When a prominent automobile manufacturing company fails, it always involves a number of materials and parts makers, who are large creditors, and seriously affects several thousand local dealers.

The relationship and interdependence in the automobile industry is much closer and more intricate than is realized. Sometimes large car manufacturers have to finance the makers of some particular part to insure obtaining it in the quantities and at the times required. On the other hand, engines, axle and tire manufacturers often have to extend credit to a car manufacturer through the heavy manufacturing season in the winter until payments for the finished cars come in.

So dependent and delicately adjusted is the industry that no section of it nor hardly any individual unit can be vitally affected without having a disturbing influence on other elements both inside and outside of the immediate industry.



A Simple But Effective Tire Display

Vulcanizers Needed in Air Service

There is an urgent need of obtaining skilled workmen to serve in the air service of the United States Army behind the fighting lines in France. Recruiting for this service will be carried on continuously until March 31, 1918, at least, and in the long list of workmen skilled in different branches of mechanics required are included vulcanizers. All applicants must be physically fit, white, and from 18 to 40 years of age.

Items of Interest to the Tire Trade

Mason Tire & Rubber Co. Issues Year Book—Handy Vehicle for Delivering Tires—News Notes of the Tire Industry

The Mason Book

In order to emphasize the human element entering into the manufacture of its tires, the Mason Tire & Rubber Co., Kent, Ohio, has brought out a handsome year book containing photographic reproductions of members of the company's great organization. Not only the men in the various departments of the factory, but also the men in the factory branches and distributing stations are represented. The process of building the Mason tire, from the crude rubber to the finished product, is also graphically illustrated.

The Mason plant is built on a unit system. The factory, when additions now being made are completed, will have 93,471 sq. ft. of floor space. The number of employes engaged in actual production of tires and tubes will then be in excess of 500, and the capacity of the plant will be 1,500 tires a day.

The business offices, experimental laboratory and restaurant occupy separate buildings apart from the factory proper. A complete printing plant is being installed in the basement of the office building to take care of Mason printing.

Provision has been made for further construction, when necessary, for the proper handling of the company's steadily increasing business.

Land upon which the Mason plant is located comprises sixteen and one-half acres at the edge of the corporate limits of Kent and between the N. O. T. traction line and the Erie Railroad. A spur has been laid down from the Erie main line directly to the Mason shops in order to handle Mason shipments with the utmost ease and despatch. Transportation facilities are excellent. Besides the Erie Railroad, the Baltimore & Ohio and the Wheeling & Lake Erie are within short trucking distance.

A Handy Suggestion for Delivering Tires

The accompanying photograph illustrates a handy suggestion for delivering tires in quick time. Garages, as well as

stores, simply handling auto accessories have found it profitable to handle tires. Not only is the percentage of profit a sufficient reason for handling them, but they bring people into the store, where they have ample opportunity to invest in other lines on display.

In these days of war economy the purchase of a new tire is put off until there is a blow-out or something of that sort on the road. Then speedy service is appreciated, and the more speedily this is rendered the more it is appreciated. Out at Xenia, Ohio, one dealer in these wares believes he has solved the problem with the attractive little vehicle of the picture. It is inexpensive, travels quickly, holds the tires and necessary devices for changing, and anything else the motorist may need, and in addition, proves a constant advertisement for its owner.

Fisk Service Station Moves

The Fisk Rubber Co. recently moved to a new service station at Second and Monroe streets, Spokane, Wash.

Owen to Build Factory

The Owen Tire & Rubber Co., Bedford, Ohio, is having plans prepared for a factory to cost approximately $800,000.

Norwalk Building Addition

The Norwalk Tire & Rubber Co., Norwalk, Conn., proposes to build two additions, one costing $20,000 and the other $2,000.

Day Manager of Fisk Branch

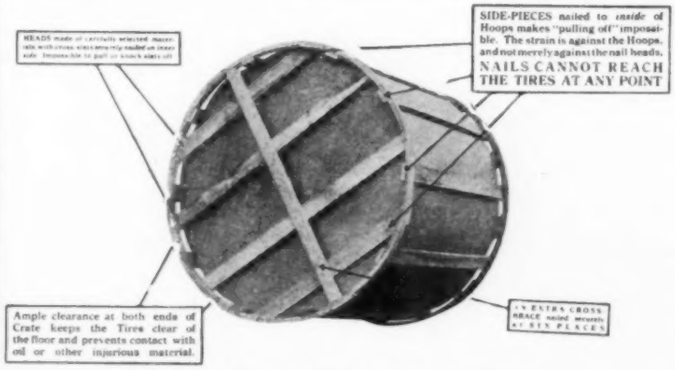
Rodney W. Day, formerly at the Buffalo, N. Y., branch of the Fisk Rubber Co., has been made manager of the Erie, Pa., branch.

Dallas Branch Moves

Kelley-Springfield Tire Co., Dallas, Tex., has moved to its new home at 1505-18 Young street. H. O. Thompson is manager.

Standard Four Tire Co. to Expand

Th Standard Four Tire Co., Keokuk, Iowa, reports that at a recent meeting of stockholders, held Dec. 17, it was unani-


SIDE-PIECES nailed to *inside* of Hoops makes "pulling off" impossible. The strain is against the Hoops, and not merely against the nail heads.
NAILS CANNOT REACH THE TIRES AT ANY POINT
Ample clearance at both ends of Crate keeps the Tires clear of the floor and prevents contact with oil or other injurious material.

Heads are made up complete here at the Factory. Nothing Required in Assembling them, except to nail on the Side Pieces.

We've Been Helping You to "Practice Conservation" for Years!

MR. HOOVER and his helpers are preaching a live idea, and we're with them to the finish—heart and soul, just as you are.

But we've been helping you put across that very idea in the rubber business for years; and now that the reduction of every sort of waste is a national virtue, it's good to remember that *your* start was made long ago.

You Are Conserving "Men and Materials" in These Real Ways When You Ship Your Tires in Steele-Alderfer Tire Crates:—

MEN—Packing in Steel-Alderfer Crates can be done with a smaller force than possible with other methods—a big object when short of help.

MEN—Time—The "swing" of putting up tires in Steele-Alderfer Crates is quickly learned; men make better speed than when using bulkier or more cumbersome packages.

MATERIALS—Money—Tires in Steele-Alderfer Crates take a lower freight rate than when shipped loose, or in other kinds of packages. Don't overlook the economy.

MATERIALS—Space Occupied—Steele-Alderfer Crates hold more tires than packages of other form of same cubic contents—owing to their cylindrical shape and compact construction.

MATERIALS—Tires packed in Steele-Alderfer Crates are protected against every ordinary injury. Damage claims vastly reduced.

MATERIALS—Tires in Steele-Alderfer Crates held clear of floor and protected against contact at sides; danger of damage in storage thus greatly lessened.

Better get particulars now. We have important things to tell you—about *your* business as well as ours. No obligation in asking for them.

THE STEELE-ALDERFER CO., Cuyahoga Falls, Ohio, *Near Akron*

Makers of Automobile Tire Crates, Hose Reels, Hose Cores, Carriage Tire Reels and Other Containers for Shipping Rubber Products. "If We Haven't a Package Suited to Shipping Your Product, We'll Make One for You."

mously voted to expand the company to a $4,150,000 concern, and erect a large and one of the most modern tire plants in the country.

The preferred stock will be increased from $500,000 to $3,500,000 and the common stock from $150,000 to $650,000.

The main building of the new plant will be 400x100 ft. and four stories high. There will be separate buildings for the power plant and the administration offices. Besides fabric tires both cord and truck tires will be manufactured in the new plant.

At this meeting it was also decided to set aside the 8 per cent interest on preferred stock for the past year to be paid this month, and to declare a 20 per cent dividend on the common stock out of the earnings of the past year.

Fisk Declares Dividend

The Fisk Rubber Co., Chicopee Falls, Mass., has declared a quarterly dividend of 1¾ per cent on its second preferred stock, payable Dec. 15.

U. S. Building Addition at Williamsport

The United States Rubber Co. is planning the erection of a five-story addition at Williamsport, Pa. A new power plant will also be built.

Firestone Patch for Jobbers

To meet the demand created by the many jobbing houses of the country for a special blow-out cycle patch designed for distribution through them exclusively, the Firestone Tire & Rubber Co., Akron, Ohio, announces the production of a full-sized patch of this description, specially designed. C. H. Gerhold, western manager of the Firestone Co.'s accessories and cycle tire sales division, states that deliveries of this addition to the company's accessories line are now being made.

Firestone Designs New Patch

To meet the demand created by the new jobbing houses of the country for a special blow-out patch, designed for distribution through them exclusively, the Firestone Tire & Rubber Co., Akron, Ohio, announces the production of a full-sized patch of this description, especially designed.

Deliveries of this addition to its accessories line are already being made, according to C. H. Gerhold, Western manager of accessories and cycle tire sales division.

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HEAVY CALCINED MAGNESIA

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Combed Sea Island, combed and carded Peelers and Egyptians.

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Yarns

4s to 60s, combed and carded, single and ply; warps, skeins, tubes and cones.

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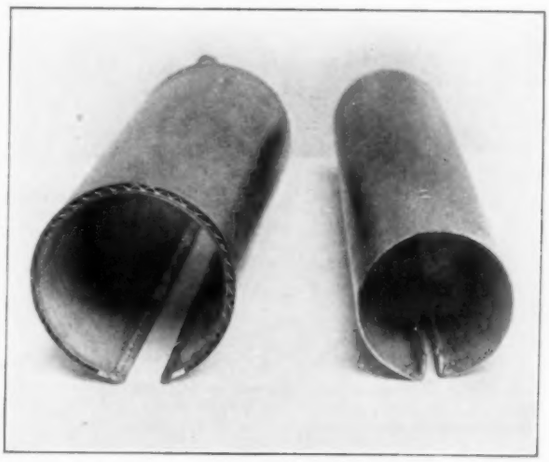

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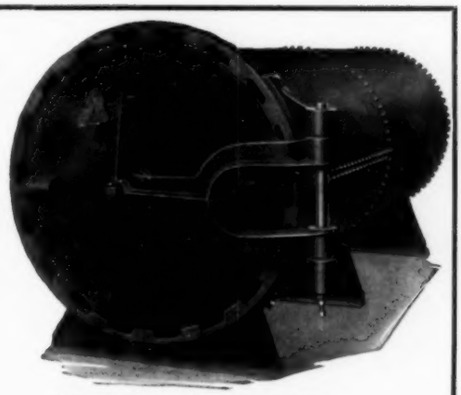

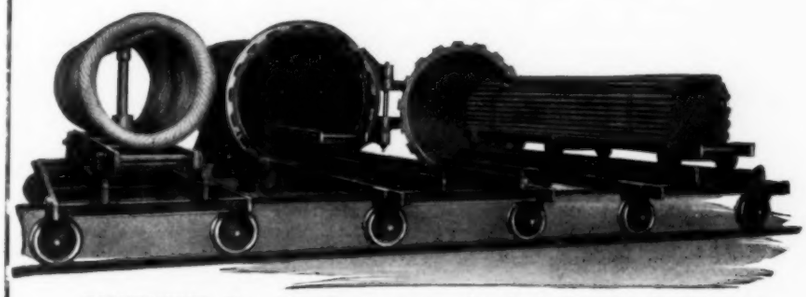

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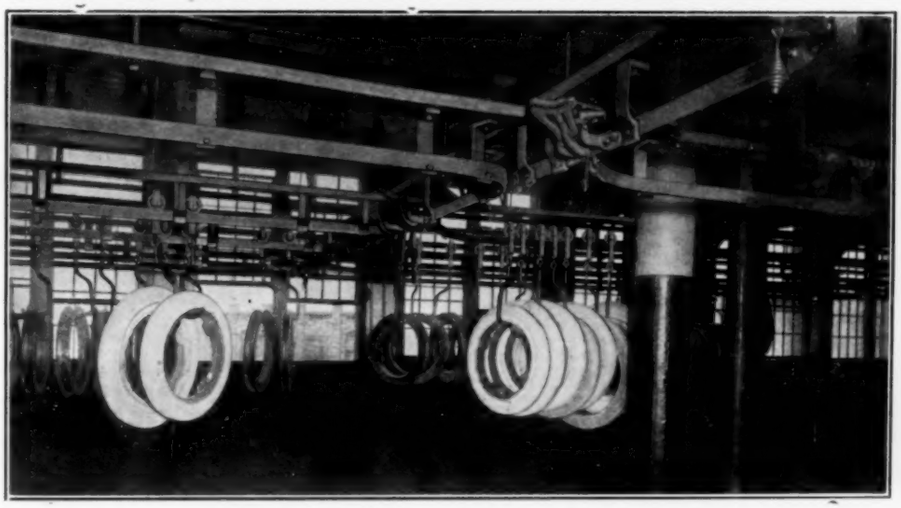

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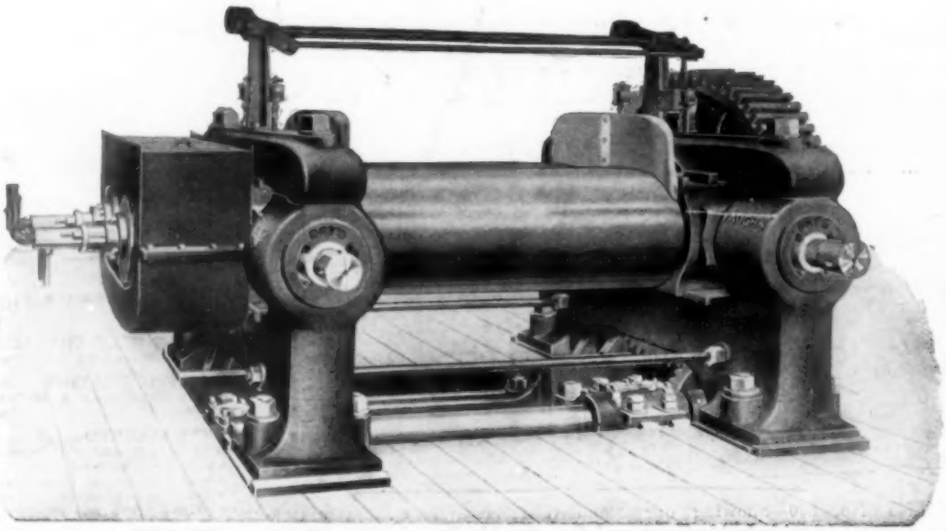

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